VOL. IV.

SMITHSONIAN

MISCELLANEOUS COLLECTIONS.

VOL. IV.

"EVERY MAN IS A VALUABLE MEMBER OF SOCIETY WHO BY HIS OBSERVATIONS, RESEARCHES, AND EXPERIMENTS PROCURES KNOWLEDGE FOR MEN."—SMITHSON.

cola.

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ARTICLE II. Synopsis of the described Lepidoptera of North America. Part I. Diurnal and Crepuscular Lepidoptera. Compiled for the Smithsonian Institution by John G. Morris. February, 1862. Pp. 376, and 30 wood-cuts.

ADVERTISEMENT.

THE present series, entitled "Smithsonian Miscellaneous Collections," is intended to embrace all the publications issued directly by the Smithsonian Institution in octavo form; those in quarto constituting the "Smithsonian Contributions to Knowledge." The quarto series includes memoirs embracing the records of extended original investigations and researches resulting in what are believed to be new truths, and constituting positive additions to the sum of human knowledge. The octavo series is designed to contain reports on the present state of our knowledge of particular branches of science; instructions for collecting and digesting facts and materials for research; lists and synopses of species of the organic and inorganic world; museum catalogues; reports of explorations; aids to bibliographical investigations, etc., generally prepared at the express request of the Institution, and at its expense.

The position of a work in one or the other of the two series will sometimes depend upon whether the required illustrations can be presented more conveniently in the quarto or the octavo form.

In both the Smithsonian Contributions to Knowledge, and the present series, each article is separately paged and indexed, and the actual date of its publication is that given on its special title-page, and not that of the volume in which it is placed. In many cases, works have been published, and largely distributed, years before their combination into volumes.

While due care is taken on the part of the Smithsonian Institution to insure a proper standard of excellence in its publications, it will be readily understood that it cannot hold itself responsible for the facts and conclusions of the authors, as it is impossible in most cases to verify their statements.

JOSEPH HENRY,
Secretary S. I.

SYNOPSIS

OF THE

NEUROPTERA OF NORTH AMERICA.

SMITHSONIAN MISCELLANEOUS COLLECTIONS.

SYNOPSIS

OF THE

NEUROPTERA

OF

NORTH AMERICA.

WITH A LIST OF THE SOUTH AMERICAN SPECIES.

PREPARED FOR THE SMITHSONIAN INSTITUTION

BY

HERMANN HAGEN.

WASHINGTON:
SMITHSONIAN INSTITUTION.
JULY, 1861.

ADVERTISEMENT.

THE present "Synopsis of North American Neuroptera" has been prepared by Dr. Hermann Hagen of Königsberg (one of the highest living authorities on this subject), at the special request of the Smithsonian Institution, from materials in considerable part supplied by the collections of the Institution, or furnished for the purpose, by correspondents, at its request. It is hoped that the publication of this work and its distribution throughout the country will call attention to the insects of this order, and result in the collection of fuller materials, to be used hereafter in the preparation of a more perfect report.

For the purpose of making the present work serve the purpose of a report on the Neuroptera of the New World, a list of the names of the known South American species has been added. Some of these have not yet been published, but descriptions of them will shortly be presented to the world by Dr. Hagen in some one of the German scientific journals.

The manuscript of this work was furnished by Dr. Hagen in Latin, and it has been translated into English by Mr. P. R. Uhler of Baltimore. To him, and to Baron R. Osten Sacken, the Institution is under obligations for the careful examination and correction of the proof sheets.

JOSEPH HENRY,
Secretary S. I.

SMITHSONIAN INSTITUTION,
WASHINGTON, June, 1861.

ACCEPTED FOR PUBLICATION, NOVEMBER, 1860.

PHILADELPHIA:
COLLINS, PRINTER.

PREFACE.

The following Synopsis of the Neuroptera of North America has been prepared in accordance with the desire of the Smithsonian Institution, and contains all the known species found hitherto in the United States, in the English and Russian colonies, Mexico, Central America, and the West Indies. Many species described originally as belonging to the last-named countries, may hereafter be found in the southern parts of the United States.

The materials upon which the Synopsis has been based are the following:—

1. Species furnished by the Smithsonian Institution, chiefly Odonata, collected by Capt. J. Pope, U. S. A., on the Pecos River, Western Texas (lat. 32°, long. 104°), by Dr. Berlandier and Lt. Couch, U. S. A., at Matamoras, and by Dr. Engelmann at St. Louis.

2. The very numerous species collected by Baron Osten Sacken in different parts of the United States, particularly at Washington, at Trenton Falls, at Savannah and Dalton in Georgia, at Berkeley Springs in Virginia, in Florida, in Cuba, on the St. Lawrence River, and at Chicago.

3. A considerable number of Odonata, collected by Mr. Abbot in Georgia, and furnished by the late Mr. Escher-Zollickofer of Zurich.

4. A considerable number of Odonata, collected by the late Mr. Guex at Bergen Hill in New Jersey, and communicated by Prof. Schaum of Berlin.

5. A considerable number of Neuroptera from California, Maryland, Illinois, and North Red River (from Mr. Robert Kennicott), furnished by Mr. P. R. Uhler of Baltimore.

6. Some species collected in Florida by Mr. Norton, and at New York by Mr. Calverly.

7. Other species collected in South Carolina by Mr. Zimmermann, and furnished by the late Prof. Germar of Halle.

8. A considerable number of Neuroptera collected in Cuba and furnished by Prof. Poey of Havana.

9. A considerable number of Neuroptera collected in Mexico and supplied by Mr. de Saussure of Geneva.

10. My own collection, containing the types of Winthem, described by Prof. Burmeister, and some species furnished by the late Mr. Say.

11. Many species collected in the Russian colonies and in California, communicated by Mr. Menetries from the Imperial Museum of St. Petersburg, and by Colonel Motschulsky.

12. The Neuroptera of North America of the Museum at Berlin, furnished by Dr. Gerstaecker.

13. The Neuroptera of North America of the Museum at Vienna, communicated by Mr. Kollar.

14. The Neuroptera of North America of the collection of the Baron Selys Longchamps at Liege, with the types described by Messrs. Rambur, Latreille, Palisot de Beauvois, contained in Serville's collection, and some supplied by Mr. Asa Fitch.

15. Some types, chiefly from Labrador, described by Mr. Burmeister, and contained in the collection of Mr. Sommer at Altona.

16. The very great number of Neuroptera of the British Museum in London, described by Mr. Fr. Walker, chiefly from Canada and the polar regions, which I examined at London in 1857, with the kind permission of Dr. J. E. Gray.

I have endeavored to cite the literature of the subject as completely as possible. Besides the printed works, I have taken advantage of written communications made by Mr. Haldeman and Mr. Uhler on those species, which had been described by them. The rare memoir of the late Mr. Say, "Godman's Western Quarterly Reporter, Vol. II," could not be procured, except in a manuscript copy kindly communicated by Baron Osten Sacken.

An exclamation mark (!) has been added to every species contained in my own collection, or described by me from actual examination.

Where an (!) has been added to the name of the author, I have seen the types which he described.

The foregoing statements show that the Synopsis has been principally composed from species which I myself have examined, and

which can be considered as undoubtedly fixed. There are, however, some, especially from the British Museum, which are not entirely certain, the time I could spend at London not being sufficient to determine all the species. The number, however, of species mentioned in the Synopsis not examined by myself is but small.

I have added a Catalogue of all the species of South American Neuroptera hitherto described, and of the new species contained in my collection. All the yet undescribed species have been added to the present Catalogue, as their publication, which has already partly been effected (Gomphidæ), will soon be terminated.

There can be no doubt that the species named in the Synopsis and in the Catalogue constitute only a fraction of the Neuropterous Fauna of America; may its incompleteness be soon shown by a multitude of new discoveries.

DR. H. HAGEN.

KOENIGSBERG, 8th April, 1860.

Note.—The measurements given are in millimetres. A millimetre is equal to .039 of the English inch, or about .04 (= $\frac{1}{25}$). Multiplying, then, any number of millimetres by four, and setting off two places of decimals, will at once give us the inches and fractions.

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AUTHORITIES.

NORTH AMERICAN NEUROPTERA.

Bartram, John.—Observations on the Dragon-Fly, or Libellula of Pennsylvania. Philos. Transact. 1750, XLVI, 323. Observations upon the metamorphosis of the Odonata in general.

Blanchard, Emile.—Histoire naturelle des Insectes, etc. Paris, 1840, 1841, etc. 3 vols. 150 pl. Contains description of some typical forms from N. America, but no new species.

——— Les planches dans Cuvier règne animal, edit. Masson, 1836—1846, 8vo. *Corydalis cornuta* and *Chauliodes pectinicornis* are figured in this work.

Browne, Patrice.—The Civil and Natural History of Jamaica. London, 1789 (1756), fol. pp. 437. Four species of Odonata are mentioned: "1. Tota viridis; 2. Fusca tenuis, ad oculos et anum coeruleo-nitens; 3. Maxima rufula, pectore crassiori; 4. Tenuior tota coerulea. These insects are very common in Jamaica."

Burmeister, Hermann.—Handbuch der Entomologie. Neuroptera, II, Part I. Berlin, 1839, 8vo. 60 species from N. America are described in this work; 36 of them are new.

——— Zoologischer Hand Atlas. Berlin, 1836—1843. Fol., 41 pl. *Termes flavipes* and its nympha are figured. (I have examined the types of Mr. Burmeister.)

Coquebert, Ant. Joh.—Illustratio iconographica insectorum quæ in museis parisinis observavit J. C. Fabricius. Paris, 1799—1804. Fol., 30 pl. *Libellula eponina* figured.

Curtis, John.—Description of the Insects brought home by Commander James Clark. Ross's Second Voyage. App. Nat. Hist. 1831, 4to. — pl. *Tinodes hirtipes* described.

Drury, Drew.—Illustrations of Natural History, etc. London, 1770—1782, 4to. 3 vols. (ed. Westwood, 1837). Several species are figured and described.

Duncan, J.—Introduction to Entomology. London, 1840. 8vo., — pl. *Libellula axillena* figured by Mr. Westwood.

Erichson, Fr. W.—Beitraege zu einer Monographie von Mantispa. Germar's Zeitschrift f. Entomologie, 1839, 8vo. I, Part I, 147—173, 1 pl. Contains three species.

——— Insekten in Schomburgk's Reise in Guyana, 1848, 8vo. III. Contains several species from the West Indies.

Fabricius, J. C.—Entomologia Systematica et Supplementa. Hafniæ, 1792—1798, 8vo. 5 vols. Seventeen species are described, nine of them are new. (The same are contained in the works previously published by this author, viz: Systema Entomologiæ, 1775; Species Insectorum, 1781; and Mantissa Insectorum, 1787.)

Fabricius, Otto.—Fauna Groenlandica. Hafniæ, 1780, 8vo. Contains *Libellula virgo* (erroneously), *Phryganea rhombica*, *Termes divinatorium*. See Schioedte.

Fitch, Asa.—First Report on the Noxious, Beneficial, and other Insects of the State of New York. Albany, 1855, 8vo. Thirty-six species of *Chrysopina* and *Hemerobina* are described, mostly new.

——— Winter Insects of eastern New York, from Dr. Emmons' Journal of Agriculture and Science, 1847, vol. v, p. 274. Contains two species of *Boreus* and two of *Perla* new to science.

De Geer, Charles.—Mémoires pour servir à l'histoire des insectes. Stockholm, 4to, 1752—1778, 7 vols. Four species are described, two of them new.

Giebel, C. G.—Fauna der Vorwelt, etc. Leipzig, 8vo. 1856. T. II, P. I, Insecta. *Termes debilis* included in gum Animé, described by Prof. Heer, erroneously, as a succinic insect.

Gosse.—Canadian Naturalist. I have not seen this work, which contains two new *Pteronarcys*.

Gray, G. R.—In E. Griffith's Animal Kingdom. London, 1824—1833. 8vo. 16 vols. Contains some new species.

Guérin-Meneville, F. E.—Iconographie du Règne animal. I have not seen this work, which contains one new *Palingenia*.

Guilding, Landsdowne.—The generic characters of Formicaleo, with the description of two new species (from the West Indies). Trans. Linn. Soc. Lond. 1829, vol. xvi, p. 47.

Hagen, H.—Monographie von Termes in Linnæa, X, XII, XIV. 1855—1860.

——— Revue des Odonates; Monographie des Calopterygines; Monographie des Gomphines. (cf. Selys Longchamps.)

Haldeman.—Description of the *Agrion veneri-notatum*. Proceed. Acad. Philad. 1844. *Termes nigriceps*, ibid. 1853, June.

——— *Corydalus cornutus*. Journ. Acad. Boston, 1848, with plates.

Harris, Dr. T. W.—A Treatise on some of the Insects of New England, which are injurious to Vegetation. Boston, 1852. I regret much not to have seen this excellent work. Contains one *Chrysopa*.

Heer, O.—Die Insectenfauna der Tertiaergebilde von Oeningen und

Radoboj. Leipzig, 1849, 4to. T. II. Contains *Termes debilis* as succinic insect (included in Gum Animé).

Kirby, W.—Fauna boreali-Americana, etc. Norwich, 1837, 4to. Contains a List of arctic Insects, *Libellula virgo* and *Phryganea rhombica* from O. Fabricius, and *Tinodes hirtipes* from J. Curtis; besides p. 252 the descriptions of four species taken in lat. 65—68. *Agrion puella* probably erroneously determined, and three new species, *Perla bicaudata* (erroneously), *Limnephilus nebulosus* and *femoralis;* the descriptions are very incomplete.

Klug, Friedr.—Monographie der Panorpatae. Act. Acad. Berolin. 1836, 4to., 1 plate. Contains five species, three new ones from N. America.

Kolenati, F.—Genera et Species Trichopterorum. Part I. Prague, 1848, 4to. Contains three species from Greenland, Labrador, and N. America, one of them new.

——— Systematisches Verzeichniss der dem Verfasser bekannten Phryganiden und deren Synonymik. Wien. Entom. Monatschrift, T. III, 1859, p. 15. Contains the names of six species from N. America, four of them new.

——— Genera et Species Trichopterorum. Part II. Nouv. Mémoir. de la Soc. Impér. des Naturalistes à Moscou. 1859, T. XI, 4. I have not seen this work, which contains the descriptions of the species mentioned in the foregoing work.

Kollar, V.—Naturgeschichte der schaedlichen Insekten. Wien, 1837, 4to. Contains *Termes flavipes*, injurious in the warmhouses of Schoenbrunn and Vienna. This description has been omitted in the translation of this work by Mr. Loudon.

Latreille, P.—Histoire naturelle, etc. des Insectes. Paris, 8vo. 1792—1805, vol. xiv.

——— Genera Crustaceorum et Insectorum. Paris, 4to. 1806—1809, vol. iv. Some species from N. America are described, but none of them are new.

Leidy, J.—Internal Anatomy of *Corydalus cornutus* in its three stages of existence (with Haldeman).

Lichtenstein.—Catalogus musei ditissimi (Holthuisen). Hamburg, 1796, 8vo. Part III. Contains one new Ephemera.

Linne, C.—Systema Naturæ ed. XII. 1767, 8vo. Contains three species from N. America, two of which are described previously in Centuria Insector. 1763, 4to., or in Amoenit. Acad., vol. vi. The ed. xiii, by Mr. Gmelin, contains several species described by different authors.

v. Motschulsky, V.—Two species of Termes from N. America are mentioned in the Etudes Entomologiques, T. IV. I find mentioned Etudes VIII, p. 11, two species of Phryganina from N. America, *Leptocera flexuosa* Haldeman, and *Leptocera 8-maculata* Haldeman. I do not know if, or where, these species are described.

Newman, E.—Several species, chiefly Perlina, are described in Entomological Magaz., vol. v, and in Annals of Nat. History, vol. xiii, by this author.

Newport, G.—On the Genus Pteronarcys. Trans. Linn. Soc. Lond., vol. xx, and Annals of Nat. Histor., vol. xiii, contains, moreover, some species of Perlina.

Olivier, G.—Encyclopédie méthodique, vol. vii, 4to. Some species of N. America are described by this author.

Palisot Beauvois.—Insectes recueillis en Afrique et en Amérique. Paris, 1805—1821, fol. Three species are described by this author.

Perty, M.—Delectus animalium articulatorum, etc. Monachiæ, 1830, 4to. One species of Termes from the West Indies has been described.

Pictet, F.—Histoire naturelle, etc. des insectes Neuroptères. Part I, Perlides; Part II, Ephémérines. Genève, 1841—1845, 8vo., with pl. color. Numerous species are figured and described in this first-rate work.

Reichenbach.—Volks-naturgeschichte. *Termes flavipes* has been figured in this work.

Rambur, P.—Histoire naturelle des Neuroptères. Paris, 1842, 8vo., with plates (forms a part of the Suites à Buffon, published by Roret). Numerous species are perfectly described, mostly new.

Say, Th.—Descriptions of insects belonging to the order Neuroptera Linn. Latr., collected by the expedition authorized by J. C. Calhoun, etc. under the command of Major S. H. Long, in Godman's Western Quarterly Reporter, 1823, vol. ii, No. 2, article iv, pp. 160, 165. This very rare work contains four species of Phryganina, three Ephemerina, one Myrmeleon, one Bittacus, and four Perlina, well described.

——— Nine Species of Neuroptera (three Ephem., one Ascalaphus, two Hemerob., one Chauliodes, two Phrygan.), in Keating's narrative of an expedition to the source of St. Peter's River, etc., under the command of Major Long. Philadelphia, 1824, 8vo., vol. ii, p. 205.

——— American Entomology, vol. ii, 1825, 8vo. Contains six figures (two Mantispa and four Phryganea), described and figured.

——— Descriptions of new N. American Neuropterous Insects, and observations on some already described by (the late) Th. Say. Journ. Acad. of Nat. Sci. of Philadelphia, 1839, vol. viii, Part I, p. 9—46. Contains the descriptions of forty-nine species (ten Aeschna, twenty-one Libellula, three Calopteryx, three Lestes, four Agrion, four Baetis, one Ephemera, two Formicaleo, one Chrysopa), mostly new to science. Unfortunately the work of Prof. Burmeister was published at the same time and contains some species described by Mr. Say under different names.

Savigny, J. C.—Description de l'Egypte. Paris, 1825, fol. Contains the figure of one species of Libellula (*L. flavescens*), found in N. America.

Schioedte, J. C.—Arthropoden Groenlands, in Rink, geographischer, etc., Beschreibung Groenlands and in Berlin Entom. Zeitschr., 1859, t. III, p. 134. Contains four species (one Ephem., one Hemerob., two Phrygan.).

Schneider, W. G.—Symbolæ ad Monographiam generis Chrysopæ Leach. Vratislaviæ, 1851, 8vo., with plat. color. Contains seven species, well described and figured.

De Selys Longchamps, E.—Revue des Odonates ou Libellules d'Europe avec la collaboration de H. Hagen. Paris, 1850, 8vo. (Mémoir. Soc. R. Science de Liége, vol. vi). Two species, *Lib. hudsonica*, p. 53, and *Agrion Doubledayi*, p. 209, are described in this work.

——— Synopsis des Calopterygines. Bullet. Acad. Bruxelles, 1853, t. xx.

——— Monographie des Caloptérygines avec collab. H. Hagen. Paris, 1854, 8vo. (Mém. Soc. R. Science de Liége, vol. ?). Fourteen species from N. America are described in this work.

——— Synopsis des Gomphines. Bullet. Acad. Bruxell. 1854, t. xxi.

——— Monographie des Gomphines, avec collab. H. Hagen. Paris, 1857, 8vo. (Mém. Soc. R. Science de Liége, vol. ?). Thirty-four species from N. America are described in this work.

——— Additions au Synopsis des Caloptérygines. Bullet. Acad. Bruxell. ser. 2, 1859, T. VII, No. 7.

——— Additions au Synopsis des Gomphines. Bullet. Acad. Bruxell., ser. 2, 1859, T. VII, No. 8.

——— Neuroptères de l'isle de Cuba, de la Sagra Hist. Cuba, 1857, fol., T. VII, p. 183—201, or in Poey, Ins. Cuba, 8vo., p. 435—473. Contains thirty-nine species from the West Indies, chiefly Odonata; several of them are new to science.

Sloane, H.—A voyage to the islands Madeira, Barbadoes, Nieves, St. Christopher's, and Jamaica, with the natural history, etc. of insects. London, 1707—1725, fol., 2 vols. Ten species of Libellula from Jamaica have been described in this work: 1. Libellula rufa major (an *L. abdominalis?*); 2. L. rufa minor (an *L. simplex?*); 3. L. maxima cœrulea aut viridis (an *Aeschna ingens?*); 4. L. purpurea (*Lib. discolor*); 5. L. cœrulea minor (*Agrion* spec.).

Stephens, J. F.—Illustrations of British Entomology. London, 8vo., 1835. Mandibulata, vol. VI. Some species of European Neuroptera mentioned in this work have been found in N. America.

Swederus, N. S.—Two species of Panorpa have been described by this author, Vetensk. Acad. nya Handl. Stockholm, 1787, T. VIII.

Uhler, P. R.—Contributions to the Neuropterology of the United States. Proceed. Acad. of Nat. Sc. Philad., 1857, March, p. 87. Seven species of Odonata are described.

Walker, F.—Catalogue of the Specimens of Neuropterous Insects in the Collection of the British Museum. London, 8vo., Part I, 1852 (Phryganides, Perlides), p. 1—192; Part II, 1853 (Sialidæ—Ne-

mopterides), p. 193—476; Part III, 1853 (Termitidæ—Ephemeridæ), p. 477—585; Part IV, 1853 (Odonata, Calopteryginæ), p. 586—658. In this work 234 species from N. America are described; numerous of them are new, chiefly from Canada and the Arctic regions.

Wesmael, C.—Sur les Hemerobides de Belgique. Bullet. Acad. Bruxell., 1841, vol. viii, p. 203. One species of Europe described here has been found in N. America.

Westwood, J. O.—Monograph of the genus Panorpa. Trans. Entom. Soc. Lond., vol. iv, with plates. Contains fourteen species from N. America, some of them new.

——— On the genus Mantispa. Trans. Ent. Soc. Lond., new ser., vol. i, with plates. Contains three species from N. America.

——— Introduction to the modern Classification of Insects. London, 1840, 8vo., vol. ii. Contains Termes flavipes, figured.

Zetterstedt, J. W.—Insecta Lapponica. Lipsiæ, 1840, 4to. Some species from Lapland have been found in the Arctic regions of N. America.

SOUTH AMERICAN NEUROPTERA.

(The authorities mentioned above for North American Neuroptera are omitted.)

Blanchard, E.—Insectes du voyage dans l'Amérique méridionale de M. Alcide d'Orbigny. 4to. pl.

——— Insectes dans C. Gay historia fisica de Chili. Paris, 1851, 4to. I have not seen this work; a few Neuroptera are described and figured.[1]

Fischer von Waldheim, G.—Notice sur quelques Orthoptères et Neuroptères du Brésil. Bullet. Acad. Moscow, 1834, T. VII, p. 322, 1 pl. col. Two Mantispa are described and figured.

Hagen, H.—Neuroptera von Mossambic in Peters Reise, T. II. Written and printed 1853, but not yet published. Two Termes from Brazil are described.

——— Monographie der Gattung Oligoneuria. Stettin, Entomol. Zeit. 1856, T. XVI, p. 262.

——— Description of *Mantispa chilensis*, in Stettin. Entom. Zeit., 1859, T. XX, p. 408.

Kirby, W.—Description of the *Agrion brightwelli* in Trans. Linn. Soc. London, 1825, T. XIV.

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[1] Twenty-six new species are described, and most of them figured. (Osten Sacken.)

Kollar, V.—Brasiliens vorzüglich lästige Insecten in Dr. Pohl's Reise in Brasilien. Wien, 1832, 4to. Two species of Termes are described and figured.

Pictet, F. J.—Description de quelques nouvelles espèces de Neuroptères du Musée de Genève. Mém. Soc. Phys. Genève, 1836, T. VII, p. 299. *Bittacus blanchetti* and *Macronema lineatum* are described and figured.

Percheron, A.—Genera des Insectes, with pl. Paris, 1831, 8vo. (with M. Guérin). One species of Palingenia has been described.

Retzius, A.—C. De Geer genera et species insectorum ex auctoris scriptis extr. Lipsiæ, 1783, 8vo.

Rengger, J.—Reise nach Paraguay. Aarau, 1835, 8vo. Some species of Termes have been described in this work.

Seba, A.—Locupletissimi rerum naturalium thesauri accurata descriptio et iconibus expressio. Amsterdam, 1734—1764, fol., 4 vols. Few species of Odonata are figured.

Serville, A.—Les Neuroptères, dans le t. X d'Encyclopedie méthodique de M. Olivier. (*Mantispa semihyalina.*)

Thunberg, C. P.—Fauna Surinamensis. Upsalia, 1822, 4to.

——— Fauna Cayennensis. Upsaliæ, 1823, 4to.

——— Fauna Brasiliensis. Upsaliæ, 1823, 4to.

——— Fauna Americæ meridionalis. Upsaliæ, 1823, 4to., 3 parts. I have not been able to use this work, which contains the complete list of all the species described. (cf. Stett. Entom. Zeit. XVIII, p. 202.)

Weber, F.—Observationes entomologicæ. Kiel, 1801, 8vo. (*Ephemera atrostoma.*)

Westwood, J. O.—Characters of Embia. Trans. Linn. Soc. Lond., 1837, T. XVII, with pl.

ANALYTICAL TABLE.[1]

SECTIONS.

SECTION I.—PSEUDONEUROPTERA ERICHS.

Mandibulate insects with an incomplete metamorphosis (active pupa); lower lip mostly cleft; four membranaceous, reticulate wings (rarely with rudimentary wings or apterous); antennæ either subulate, and then the tarsi three- to five-articulate, or setiform, or filiform, in which case the tarsi are two- to four-articulate.

FAMILIES.—*Termitina, Embidina, Psocina, Perlina, Ephemerina, Odonata.*

SECTION II.—NEUROPTERA ERICHS.

Mandibulate insects with complete metamorphosis (inactive pupa); lower lip entire; four membranaceous, more or less reticulate wings rarely with rudimentary wings or apterous); antennæ setiform, filiform, clavate, capitate, or pectinate; tarsi five-articulate.

FAMILIES.—*Sialina, Hemerobina, Panorpina, Phryganina.*

FAMILIES.

Four or two distinct wings;

Antennæ inconspicuous, subulate, short and slender.

Anterior and posterior wings nearly of the same length; tarsi triarticulate. Fam. VI. ODONATA.

Posterior wings either smaller or wanting; tarsi four- or five-articulate. Fam. V. EPHEMERINA.

Antennæ mostly conspicuous, setiform, filiform, clavate, capitate, or pectinate.

Tarsi two- or three-articulate;

Wings equal. Fam. II. EMBIDINA.

[1] These tables, prepared by Baron Osten Sacken at the request of the Institution, are to be considered as merely provisional in their nature, and as not aiming at a natural arrangement of the families.

Wings unequal.
Posterior wings smaller. Fam. III. Psocina (in part).
Posterior wings broader, or at least of the same size with the anterior ones. Fam. IV. Perlina (in part).
Tarsi four-articulate; wings equal. Fam. I. Termitina (in part).
Tarsi five- (sometimes apparently four-articulate).
Posterior wings with no anal space; not folded.
Mouth more or less rostrated. Fam. IX. Panorpina (in part).
Mouth not rostrated (at the utmost only conical). Fam. VIII. Hemerobina.
Posterior wings with a folded anal space.[1]
Wings reticulate. Fam. VII. Sialina.
Transverse veins rather few. Fam. X. Phryganina (in part).
Apterous, or with rudimentary wings;
Mouth rostrated. Fam. IX. Panorpina (in part).
Mouth not rostrated.
Tarsi five-articulate. Fam. X. Phryganina (in part).
Tarsi four-articulate. Fam. I. Termitina (in part).
Tarsi three-articulate.
Apterous, or with two rudimentary wings of a leathery substance. Fam. III. Psocina (in part).
Four rudimentary wings, still with distinct neuration. Fam. IV. Perlina (in part).

[1] The anal space is absent in a few *Phryganina*.

NEUROPTERA

OF

NORTH AMERICA.

Section I. PSEUDONEUROPTERA.

Fam. I. TERMITINA.

Body depressed, ovate; head free; wings equal, membranaceous, deciduous; tarsi 4-articulate.

CALOTERMES Hagen.

Head small, two ocelli; prothorax large, transverse, oblong; costal area veined; tarsi furnished with an apical plantula.

1. C. castaneus!

Termes castaneus Burm.! II. 764, 3.—*Termes anticus* Walk.! Catal. 523, 31.—*Termes guatimalæ* Walk.! Catal. 528, 38.—*Caloterm. castaneus* Hag.! Linn. XII, 38, 1; tab. ii, fig. 2; tab. iii, fig. 2.

Chestnut-color, beneath, antennæ and feet luteous; the wings tinged with brown, margin and costal veins infuscate; head elliptical; prothorax quadrangular, anteriorly a little sinuated; median nervule approaching the subcostal one, its apex bifurcated.

Var. Smaller, pale, wings hyaline. (Cuba, St. Domingo.)

Length to tip of wings 13—20 millimetres. Length of body 6—8 millim. Expanse of wings 23—36 millim.

Hab. San Francisco, California (Chamisso); Honduras (Miller); Guatimala (Deby); Cuba; Porto-Rico; St. Domingo, Port-au-Prince (Ehrenberg); Columbia, Venezuela (Moritz, Appun); Brazil (Olfers); Rio (Schott); St. Leopoldo; Chile; Isle of France (?). Collection of de Selys Longchamps.

Note.—An exclamation point after the specific name at the head of an article shows that the description has been made by the author from a specimen. When placed after a reference, it shows that the author has seen the type of the description.

2. C. marginipennis!

Termes marginipenne Latr.! Humboldt, Recueil, II, 111; tab. xxxix, fig. 8.—*Term. mexicanus* Walker! Catal. 528, 39.—*Caloterm. marginipennis* Hag.! Linn. XII, 47, 6; XIV, 100.

Fulvous, beneath, antennæ and feet luteous; wings whitish, margin and costal veins yellowish; head square; prothorax square, anteriorly emarginate; median and subcostal veins separated.

A smaller specimen from San Diego does not differ in coloring.

Var. Smaller, fuliginous, beneath, antennæ and feet fuscous; wings dirty-fuscous, margin and costal veins infuscate. (California.)

Length to tip of wings 18—19 millimetres. Body 7—8 millim. Expanse of wings 31 millim.

Hab. Mexico (Humboldt, Muehlenpford, Deppe); Cuautla (Saussure); San Francisco and San Diego, California.

3. C. posticus!

Calotermes posticus Hag.! Linn. XII, 67, 15.

Piceous, base of the antennæ and feet bright yellow; wings ——; head square; prothorax oblong.

Length of body $4\frac{1}{2}$ millim.

Hab. St. Thomas (Moritz).

4. C. brevis!

Termes brevis Walk.! Catal. 524, 33—*Term. indecisus* Walk.! Catal. 524, 32.—*Term. flavicollis* Walk.! (in part) Catal. 502, 1 (Imago), 503 (Soldier).—*Term. lucifugus* Walk. (in part)! Catal. 505, 3.—*Caloterm. brevis* Hag.! Linn. XII, 68, 16; tab. ii, fig. 6; tab. iii, fig. 5. Linn. XIV, p. 101.

Fulvous, beneath, antennæ and feet pale; wings hyaline, costal veins yellowish, linear, head square; prothorax large, oblong, anteriorly emarginate; median nervure distant, curved before the apex, united to the subcostal one.

Length to tip of wings 9 millim. Body 4 millim. Expanse of wings 16 millim.

Hab. Mexico (Deppe), Vera-Cruz (Sallé); Central America; Jamaica (Gosse); Cuba (Poeppig, Osten Sacken); St. Thomas (Moritz), St. Fe de Bogota; Brazil (Olfers, Schott, Natterer, Kuemmel).

The variety from Mexico has the median nervure, sometimes not curved, nor joined to the subcostal one. Is it a distinct species?

TERMOPSIS Heer.

Head large; ocelli absent; prothorax small; costal area veined; tarsi with an apical plantula.

1. T. angusticollis!

Termes castaneus Walk.! Catal. 506, 4.—*Termops. angusticollis* Hag.! Linn. XII, 75, 1; tab. ii, fig. 1; tab. iii, figs. 6, 41. Linn. XIV, 101.

Rufous, beneath paler, mouth infuscate; wings dusky hyaline, costal veins rufous; head oval, flat; prothorax small, semicircular.

Length to tip of wings 26 millim. Body 11 millim. Expanse of wings 46 millim.

Hab. Louisiana (Pfeiffer); San Francisco, California (Hartweg); Ft. Steilacoom, Puget Sound (Dr. Suckley).

2. T. occidentis!

Termes occidentis Walk.! Catal. 529, 41.—*Termops. occidentis* Hag.! Linn. XII, 77, 2; tab. i, fig. 8. Linn. XIV, 101.

Soldier. Fulvous, broad, head thick, rounded; prothorax anteriorly strongly emarginate; meso- and metathorax with the posterior angles produced.

Length of body 14 millim.

Hab. West coast of Central America (Wood).

The genus of this species is doubtful; it may, perhaps, be *Termopsis angusticollis* Hagen.

TERMES Linn.

Head large, rounded, two ocelli; prothorax heart-shaped, small; costal area free; plantula absent.

1. T. flavipes!

Termes flavipes Kollar! Naturgesch. schädl. Ins. 411. Burm. II, 768, 14. Burm. Zoolog. Hand-atlas, tab. xxvii, figs. 9, 10. Westw.! Introduct. II, 14; tab. lviii, figs. 12, 14, 15. Hag.! Linn. XII, 182, 26; XIV, 107. Reichenbach Volksnaturgesch. fig. col. Latr. Diction. d'hist. nat. XXII. *Termes frontale* Haldem.! (teste Osten Sacken), Proc. Acad. Philad. 1844, II, 55.

Chestnut color; head and prothorax black-brown; antennæ brownish, annulated with pale; mouth, tibiæ and tarsi yellow;

wings whitish, a little roughened, costal veins yellowish; head quadrangular, flat, with a distinct fovea in the middle, ocelli distant, prothorax cordiform.

Length to tip of wings 9 millim. Body 5 millim. Expanse of wings 16 millim.

Hab. U. S. (Bosc, Beauvois, Schaum); Cleveland, Ohio (Le Conte); Cincinnati; Paduca (Motschulsky); Pennsylvania (Haldeman); Maryland (Uhler); Washington (Osten Sacken); Carolina (Zimmerman); Eutaw, Alabama; Florida (Osten Sacken); Mexico, Matamoras, Tamaulipas (Couch); Europe (Plant-houses of Schönbrunn, Kollar).

Specimens from Florida are smaller and paler, but not distinct.

2. T. morio!

Termes morio Latr.! Hist. Nat. XIII, 69, 3. Dict. d'hist. nat. XXII, 3. Burm.! II, 767, 11. Hagen! Linn. XII, 201, 34; tab. iii, fig. 29. Linn. XIV, 122.—*Termes cornigera* Motschulsky! Études Entom. IV, 10.

Pitchy-black; antennæ, mouth, feet and venter yellowish; wings opaque, blackish-gray, costal veins black-brown; head flat, quadrangular, a bifid impressed line upon the middle; ocelli large, distant; prothorax small, semicircular.

Length to tip of wings 12—14 millim. Body 5 to 6 millim. Expanse of wings 22—25 millim.

Hab. Guatimala (Sivers); Panama (Motschulsky); St. Domingo (Ehrenberg); Porto-Rico (Moritz); Martinique; Venezuela (Moritz, Appun); Santarem, Brazil (Bates).

Nasuti and workers from Matanzas, Cuba (Osten Sacken), seem to belong here.

3. T. debilis!

Termes debilis Heer! Insektenfauna der Tertiärgebilde II, 35, 19; tab. iii, fig. 6 (contained in gum copal). Giebel, Fauna der Vorwelt, II, 295.—*Termes morio* Burm. (in part) II, 767, 11.—*T. debilis* Hag.! Linn. XII, 205, 38; tab. iii, fig. 30.

Brownish-black, antennæ annulated with white; mouth, feet and middle of the venter yellowish; wings opaque, blackish-gray, costal veins fuscous; head convex, square, an impressed point upon the middle; ocelli small, approaching the eyes; prothorax small, rounded.

Length to tip of wings $8\frac{1}{2}$ millim. Body $3\frac{1}{2}$ millim. Expanse of wings 16 millim.

Hab. Porto-Rico (Moritz); Brazil, Congonhas (Burmeister). Frequently found in gum copal.

4. T. Rippertii!

Termes Rippertii Ramb.! Neuropt. 308, 15.—Walk.! Catal. 520, 4; Hagen! Linn. XII, 218, 47; tab. ii, fig. 13; tab. iii, fig. 32. Linn. XIV, 118.—*Termes destructor* Perty! Delect. 127; tab. xxv, fig. 9.

Ferrugineous, head piceous, fulvous in front; the antennæ, feet, prothorax and abdomen beneath in the middle luteous; wings opaque, yellowish-gray, costal veins rufous; head flat, with an impressed line; eyes very prominent, ocelli close to the eyes; prothorax semicircular, short.

Length to tip of wings 14—18 millim. Body 5—7 millim. Expanse of wings 27—35 millim.

Hab. Havana, Cuba (Rippert); Trinidad (Osten Sacken); Jamaica (Gosse); Columbia (Moritz); Brazil (Spix); Ypanema (Natterer); New-Freiburg (Beschke); Isle of France? (Collect. de Selys).

A damaged specimen from Vera Cruz (Sallé) seems to belong here.

5. T. lividus!

Termes lividus Burm.! II, 767, 12. Walk. Catal. 515, 13. Hagen! Linn. XII, 221, 49; tab. iii, fig. 33.

Testaceous, the mouth, middle of the prothorax, antennæ, feet, and margins of the abdominal segments luteous; wings opaque, yellowish gray, costal veins rufous; head small, flat, a small yellow line upon the middle, ocelli large, approaching the eyes; prothorax almost orbicular.

Length to tip of wings 14 millim. Body 6 millim. Expanse of wings 27 millim.

Hab. Port au Prince, St. Domingo (Ehrenberg).

6. T. armiger!

Termes armiger Motschulsky! Étud. Ent. IV, 10. Hagen! Linn. XII, 228, 52; tab. i, fig. 1.

A nasute soldier. Rufous; thorax and feet a little paler; head pear-shaped, large, anteriorly porrected into a long nose; mandibles ensiform; prothorax small, anterior lobe narrow, recurved, anterior angles prominent, depressed, posterior margin rounded.

Length of body $6\frac{1}{2}$ millim.

Hab. Panama, Obispo (Motschulsky).

Imago unknown.

7. T. tenuis!

Termes tenuis Hagen! Linn. XII, 231, 57; tab. iii, fig. 35.

Pale yellow; head and prothorax a little brownish; wings opaque, pale whitish-yellow, the costal veins luteous; head oblong, convex, a salient point in the middle; ocelli absent; prothorax quadrangular.

Length to tip of wings 10 millim. Body 3 millim. Expanse of wings 20 millim.

Hab. St. Domingo, Port au Prince (Ehrenberg); Columbia (Moritz); Brazil (Helm).

The ocelli, which are present in the other species, are absent in this. In other respects it belongs to the genus.

8. T. simplex!

Termes simplex Hag.! Linn. XII, 238, 60; tab. iii, fig. 23.

Fulvous, antennæ and feet yellowish, wings hyaline, a little roughened, costal veins yellowish; head rounded, convex, a distinct fovea upon the middle, ocelli small, closely approximate; prothorax flat, semicircular; wings with the median nervure absent.

Length to tip of wings 10 millim. Body 5 millim. Expanse of wings 17 millim.

Hab. Cuba (Poeppig).

An anomalous species. Only a single, very much damaged, specimen seen.

9. T. nigriceps.

Termes nigriceps Haldeman, Proceed. Acad. Philad. 1853, June, VI, 365.—Hag. Linn. XII, 230, 55.

Workers and soldiers nasute; head blackish-brassy, pyriform, nasute, antennæ, feet and body yellow.

Length of body 3 millim.

Hab. Western Mexico (Leconte). Unknown to me.

10. T. strenuus!

Termes strenuus Hagen! Linn. XIV, 105.

Fuscous, villose; mouth, antennæ, feet and margins of the

abdominal segments fulvous; wings opaque, brown, costal margin yellow, subcostal and basal veins blackish-brown; head rather large, opaque, rounded, flat, impressed in the middle, brassy, ocelli rather small, distant; prothorax semicircular, opaque.

Length to tip of wings 22—25 millim. Body 8—10 millim. Expanse of wings 42—47 millim.

Hab. Vera Cruz, Mexico (Sallé).

11. T. fumosus!

Termes fumosus Hagen! Linn. XIV, 123.—Perhaps imago of *Termes nigriceps*.

Blackish-brown, brassy; antennæ blackish-brown annulated with pale; mouth, venter and feet yellowish-brown, tibiæ a little obscure; wings opaque, dark-smoky, costal veins blackish-brown, the rest fuscous; head flat, rounded, anteriorly bi-impressed; ocelli rather large, distant; prothorax hardly narrower than the head, semicircular.

Length to tip of wings 14 millim. Body 6 millim. Expanse of wings 24 millim.

Hab. Vera Cruz, Mexico (Sallé).

I have seen similar specimens, badly preserved, from Matamoras, Tamaulipas. They may be distinct.

Fam. II. EMBIDINA.

Body depressed, linear; head free; wings equal, membranous; tarsi triarticulate.

I have seen a specimen (perhaps a larva) without wings, not well preserved, from Cuba (Gundlach, Berlin Museum). Pale fuscous. Length of body 4 millim. Belonging to the genus *Olyntha?* It is probably a new species.

Fam. III. PSOCINA.

Body oval; head free; prothorax small, obtected; wings unequal, sometimes wanting; tarsi two- or three-articulate.

CLOTHILLA Westwood.

(*Lepinotus* von Heyden; *Paradoxenus* and *Paradoxides* Motsch.)

Ocelli absent; wings incomplete, coriaceous; tarsi triarticulate.

1. C. picea!

Paradoxenus piceus Motschulsky! in lit.

Entirely piceous, with a brassy reflection.

The specimen seen was imperfect; the wings were wanting.

Length of body 1 millim.

Hab. California.

ATROPOS Leach.

Ocelli and *wings* absent; tarsi triarticulate.

1. A. divinatorius.

Termes divinatorius O. Fab. Fn. Grœnl. 214, 181.

Pale, mouth fuscous, eyes black, anus obscure (Descript. from Fab.)

Length 1 millim.?

Hab. Greenland. In old books. Perhaps it is *A. pulsatorius* Leach.

PSOCUS Latr.

Three ocelli; wings membranaceous, rather unequal; tarsi two- or three-articulate.

† *Tarsi three-articulate.*

* Discoidal cellule closed, quadrangular.

1. P. sparsus!

Psocus sparsus Hagen!

Fuscous, varied with yellow and white; nasus lineated with grayish-fuscous, front yellow, punctured and lineated with black; antennæ rather slender, pale; the two basal joints thicker, yellow, black at base; thorax fuscous, varied with yellow; femora fuscous, annulated with pale before the apex, tibiæ and tarsi pale, with the apex fuscous; anterior wings opaque, fuscous, densely varied with yellow and gray, veins yellow, spotted with fuscous; pterostigma triangular; posterior wings a little smoky, costal margin at the apex interruptedly fuscous and yellow.

Length to tip of wings 6 millim. Expanse of anterior wings 11 millim.

Hab. Washington (Osten Sacken, 1858); Baltimore (Uhler).

2. P. lugens!

Psocus lugens Hagen!

Fuscous, varied with white; nasus fuscous, lineated with gray; front fuscous, occiput striated with whitish; antennæ rather slender, brownish, two basal articulations thicker, apex pale, setæ with the apical articulations whitish; thorax fuscous, margined with white; femora fuscous, annulated with pale before the apex; tibiæ and tarsi paler, at the apex fuscous; anterior wings opaque, fuscous, densely varied with gray, margin and veins marked with white points; pterostigma triangular; posterior wings a little smoky, costal margin at the apex interruptedly white and fuscous.

Length to tip of wings $4\frac{1}{2}$ millim. Expanse of anterior wings 8 millim.

Hab. Washington (Osten Sacken, 1857).

* * Discoidal cellule open, absent.

3. P. signatus!

Psocus signatus Hagen!

Blackish-fuscous; eyes globose, distant, prominent; nasus blackish-fuscous, lineated with gray; front each side anteriorly with an oblique band, and a whitish yellow point upon the occiput; thorax margined with yellow; abdomen luteous; feet luteous, tarsi blackish-fuscous; wings hyaline, veins fuscous, pterostigma narrow, linear, blackish-fuscous, posterior margin at base fuscous; cellule at the posterior margin free, elliptically triangular.

Length to tip of wings 5 millim. Expanse of anterior wings 9 millim.

Hab. New York.

It is very much like *Psocus immunis* Stephens (*naso*, Rambur), but differs a little in the reticulation of the wings. Is it distinct?

4. P. pumilis!

Psocus pumilis Hagen!

Pale luteous; nasus brassy-fuscous, obsoletely lineated with gray; front with a medial, longitudinal, blackish-fuscous stripe, two incurved fuscous lines at the eyes; thorax marked with fuscous; the feet pale luteous; anterior wings pale grayish hyaline, pterostigma, interrupted basal band and the margin behind the

base fuscous, veins fuscous; pterostigma short, rounded; cellule of the posterior margin free, elliptical.

Length to tip of wings $3\frac{1}{2}$ millim. Expanse of anterior wings 6 millim.

Hab. New York.

†† *Tarsi two-articulate.*

* Discoidal cellule closed, quadrangular.

5. P. venosus!

Psocus venosus Burm.! II, 778, 10; Walk. Catal. 484, 9.—*Ps. magnus* Walk.! Catal. 484, 10.—*Ps. microphthalmus* Ramb. Neur. 321, 6.—*Ps. aceris* Fitch! MSS. Collection of de Selys Longchamps.

Fuscous; head brassy, antennæ blackish-fuscous (in the male rather thicker, pilose), the two basal articulations luteous; thorax margined with yellow; the feet luteous, tarsi fuscous; anterior wings fuscous or blackish-fuscous, pterostigma triangular, yellowish; basal veins yellowish, apical ones fuscous; posterior wings smoky-hyaline.

Length to tip of wings 6—8 millim. Expanse of anterior wings 12—15 millim.

Hab. New York (Winthem, Asa Fitch, Uhler); Washington (Osten Sacken, 1858); Mount Pleasant, Ohio; Mexico (Deppe); Cuba (Riehl, Poey); Maryland (Uhler).

Specimens communicated by Baron Osten Sacken are a little smaller, blacker, with the apex of the tibiæ black; but they belong to this species.

6. P. contaminatus!

Psocus contaminatus Hagen!

Fuscous; nasus yellow, scarcely lineated with obscure brown; the front luteous, two occipital spots, two at the nasus and two at the ocelli black; antennæ rather slender, fuscous; thorax black, margined with yellow; the feet luteous, knees and tarsi fuscous; wings hyaline, pterostigma triangular, blackish-fuscous; apical margin with a large band attaining to the inferior angle of the pterostigma and a spot upon the middle of the posterior margin, cloudy-fuscous; posterior wings hyaline.

Length to tip of wings 7 millim. Expanse of anterior wings 13 millim.

Hab. New York; Maryland (Uhler); Washington (Osten Sacken); Vera Cruz, Mexico (Sallé).

7. P. novæ scotiæ!

Psocus novæ scotiæ Walk. Catal. 485, 12.—*Psocus crataegi* Fitch. Collection of de Selys Longchamps.

Blackish-fuscous; head pale yellow, two spots upon the occiput and two at the eyes black; front fuscous in the middle; antennæ black; thorax black, margined with yellow; feet testaceous, tibiæ at apex and tarsi pitchy; wings hyaline, anterior ones with four fuscous spots, one at the pterostigma, another at the apex, the rest at the posterior margin, the basal one joined to an obscure spot; veins black.

Length to tip of wings 6 millim. Expanse of anterior wings 12 millim.

Hab. Nova Scotia (Redman); New York (Asa Fitch).

8. P. moestus!

Psocus moestus Hag.!

Brownish-black, spotted with yellow; nasus yellow, lineated with fuscous, and fuscous in front; occiput yellow, varied with fuscous, antennæ rather slender, pale, the two basal articulations fuscous; apex yellow; thorax and abdomen brownish-black; femora fuscous, knees yellow, tibiæ pale, their apex and the tarsi fuscous; wings milky-hyaline, densely spread with small fuscous points, veins fuscous, basal ones yellow; pterostigma triangular, the internal angle yellow.

Length to tip of wings $4\frac{1}{2}$ millim. Expanse of anterior wings 8 millim.

Hab. Dalton, Georgia (Osten Sacken).

9. P. striatus!

Psocus striatus Walk.! Catal. 486, 16.

Pallid; nasus yellow lineated with black; front yellow, a band upon the middle and punctiform lines at the eyes black; eyes of the male globose, prominent, rather approximate; antennæ fuscous, two basal articulations pale; antennæ of the male thicker, the seta hairy; thorax black marked with yellow; abdomen yellow, a black fascia upon the middle; feet pallid, femora fuscous above,

tarsi fuscous; wings hyaline, pterostigma large triangular, acute, fuscous, internal angle paler; posterior margin at base and a discoidal nebula fuscous; posterior wings hyaline.

Length to tip of wings 6¼ millim. Expanse of anterior wings 2 millim.

Hab. Nova Scotia (Redman); New York, Washington (Osten Sacken, 1857); Pennsylvania (*Zimmerman*).

10. P. quietus!

Psocus quietus Hag.!

Luteous; the nasus luteous lineated with black, a spot at base and two anteriorly black; front luteous varied with black; antennæ pale; thorax black; feet pale luteous, tibiæ at base and apex obscurer; wings hyaline, veins luteous, pterostigma triangular, inferior angle rounded, obscure.

Length to tip of wings 5 millim. Expanse of anterior wings 9 millim.

Hab. New York; Dalton, Georgia (Osten Sacken).

* * Discoidal cellule open, absent.

11. P. mobilis!

Psocus mobilis Hag.!

Pale brown, hairy; wings hyaline, pterostigma narrow, ovate; cellule at the posterior margin free, elliptical.

Length to tip of wings 2½ millim. Expanse of anterior wings 4¾ millim.

Hab. Cuba (von Winthem). Described from a single damaged specimen.

12. P. madidus!

Psocus madidus Hag.!

Pale luteous; nasus brassy fuscous, lineated with obscure gray, two spots upon the occiput and a third upon the front black; antennæ pallid; tibiæ obscurer at base; wings pale gray, with two paler obsolete bands, the veins luteous; pterostigma narrow, ovate; no posterior marginal cellule.

Length to tip of wings 3¼ millim. Expanse of anterior wings 6 millim.

Hab. New York; Dalton, Georgia (Osten Sacken).

13. P. abruptus!

Psocus abruptus Hag.!

Brown, hairy; head and thorax brassy; antennæ very slender, whitish, the apical joints infuscate at their tip; posterior femora fuscous, whitish at apex; anterior wings brown with a brassy reflection, a narrow, transverse, hyaline band before the apex, veins ciliated: pterostigma elongated, ovate; no cellule at the posterior margin; posterior wings grayish-hyaline. (Female.)

Length to tip of wings 4 millim. Expanse of anterior wings 7 millim.

Hab. Washington; Dalton, Georgia (Osten Sacken).

14. P. corruptus!

Psocus corruptus Hag.!

Pale brown, hairy; head and thorax brassy; eyes rather prominent, globose, front narrower than in the preceding; antennæ thicker, hairy, seta fuscous, all the articulations pale at base; feet pale; anterior wings shining brassy-brown, pterostigma brown; a spot before the apex, upon the costal margin and a discoidal cloud, grayish-hyaline; veins with fuscous cilia; posterior wings grayish-hyaline. (Male.)

Length to tip of wings 4 millim. Expanse of anterior wings 7 millim.

Hab. Washington (Osten Sacken, 1858); Dalton, Georgia (Osten Sacken).

Reticulation of the wings as in the preceding. Is it the other sex of that species?

The reticulation in *Ps. abruptus* and *Ps. corruptus* is abnormal, and may constitute a distinct subgenus, or rather genus.

15. P. salicis!

Psocus salicis Fitch! Collection of de Selys Longchamps.

Very small, brown; head and thorax brassy; mouth yellow; eyes very small, front broad; antennæ very slender, villose, apex obscurer; feet pale; wings hyaline, veins brown; pterostigma hyaline, anteriorly truncated; posterior marginal cellule elliptical.

Length to tip of wings $1\frac{1}{2}$ millim. Expanse of wings 3 millim.

Hab. New York (Asa Fitch).

16. P. aurantiacus!

Psocus aurantiacus Hag.!

Orange-colored, shining; head bright orange, occiput in the middle dusky; antennæ pale, brownish-black at the apex; thorax orange with four cloudy spots upon the dorsum; feet yellow, tarsi fuscous at the apex; abdomen yellow; wings yellowish-hyaline, pterostigma bright yellowish green; veins yellow, apical ones fuscous; cellule of the posterior margin orbicular. (Female.)

Length to tip of wing $3\frac{1}{2}$ millim. Expanse of wings 6 millim.

Hab. Dalton, Georgia (Osten Sacken).

Fam. IV. PERLINA.

Body depressed, elongated, parallel; prothorax large; antennæ long, setaceous; wings unequal, posterior ones broader; tarsi three-articulate.

† *Two abdominal setæ.*

* Wings charged with many irregular transverse veins.

PTERONARCYS Newman.

Wings densely net-veined; palpi setaceous; mandibles membranaceous. This genus is very abnormal on account of its imago being furnished with external branchiæ.

1. P. proteus!

Pteronarcys proteus Newman! Entom. Mag. V, 177, 3. Walk.! Catal. 139, 1. Gosse, Canadian Naturalist, fig. —, p. 232.

Fuscous, head broader than the prothorax; antennæ paler at base; sides of the prothorax emarginate, a little broader posteriorly, an interrupted yellow line upon the middle. (Is it so always?) Feet yellowish-fuscous, knees yellow; abdomen beneath yellowish; the caudal setæ luteous, paler at base; ♂ last ventral segment yellowish, narrower, sparsely punctured; ♀ ? antepenultimate segment truncated, armed with two distant, conical, yellowish appendages; wings pale grayish-hyaline, veins fuscous, clouded.

Length to tip of wings 38—48 millim. Expanse of wings 73—90 millim.

Hab. Trenton Falls, New York (Doubleday); Mackenzie River district (Richardson); North Red River (Robt. Kennicott).

2. P. regalis!

Pteronarcys regalis Newm.! Entom. Mag. V, 176, 1. Newm.! Annals Nat. Hist. XIII, 21. Pictet, Perlides, 134. Ann. Sci. Nat. I, 183. Newport! Trans. Linn. Soc. XX, p. 425; tab. xxi, fig. 1—11; 14—17. Froriep, Notiz. XXX, 179. Walker! Catal. 140, 3. *P. proteus* Pictet, Perl. 128, 1; tab. xxix, fig. 1—6. Ramb. Neuropt. p. 449.

Fuscous, head as broad as the prothorax; antennæ pitchy; sides of the prothorax emarginate, not broader behind, a narrow, yellow line upon the middle; feet fuscous; abdomen fuscous, apex yellowish; caudal setæ fuscous, at base yellowish; ♂ last ventral segment yellowish; ♀ antepenultimate segment produced, in the middle a broad, quadrangular excision; wings grayish-hyaline, before the apex a little clouded with fuscous, veins fuscous.

Length to tip of wings 44—48 millim. Expanse of wings 76—84 millim.

Hab. Canada; Mackenzie and Slave River districts (Richardson); St. Martin's Falls, Albany River, Hudson's Bay (Barnston); Philadelphia.

3. P. biloba!

Pteronarcys biloba Newm.! Entom. Mag. V, 176, 2. Pictet, Perl. 135. Walk.! Catal. 140, 3.

Brownish-black; head narrower than the prothorax; prothorax not emarginated at the sides, posteriorly a little broadened, a line upon the middle yellow; feet brownish-black; abdomen brownish-black, beneath in the middle with a broad, yellowish band; caudal setæ brownish-black; ♀ antepenultimate ventral segment blackish-brown, produced, incised in the middle; wings grayish-hyaline, before the apex a little clouded with fuscous, veins fuscous.

Length to tip of wings 46 millim. Expanse of wings 84 millim.

Hab. Trenton Falls; St. Martin's Falls, Albany River, Hudson's Bay (Barnston); Minnesota (Osten Sacken).

I have seen the typical specimens in the British Museum; but I am not certain whether the female from Minnesota belongs here.

4. P. nobilis!

Pteronarcys nobilis Hagen!

Black, head broader than the prothorax; antennæ black; prothorax quadrangular, sides straight, a yellow line narrowed in the middle; feet black; abdomen black, beneath with a broad orange

band; caudal setæ black, piceous at base; ♂ last ventral segment deep black; ♀ antepenultimate one truncated, orange, two short setiform appendages? (they cannot be clearly seen); wings grayish-hyaline, clouded with fuscous, veins fuscous.

Length to tip of wings 31—34 millim. Expanse of wings 55—66 millim.

Hab. New York.

Does the "smaller, new species" from Sherbrooke, Lower Canada (Gosse, Canadian Naturalist), belong here?

5. P. californica.

Pteronarcys californicus Newp.! Trans. Linn. Soc. XX, 450. Proceed. Linn. Soc. I, 388. Walk.! Catal. 140, 5.

Fuscous; labrum, clypeus and front rufous; prothorax with an interrupted, yellow line upon the middle; abdomen orange-yellowish, the sides fuscous, the last ventral segment broad, pilose, the apex deeply incised; caudal setæ at base yellow; antennæ and feet black; wings with obscure black veins, pterostigmal spot absent.

(Description taken from that of Mr. Newport.) (Male.)

Almost the size of *P. proteus*.

Hab. California (Hartweg).

I saw the species in the British Museum, but I am not now able to furnish a more accurate description.

6. P. insignis.

Kollaria insignis Pictet, Perl. 123; tab. iv, fig. 1—8. Walker, Catal. 138, 1.

Fuscous; head equal in width to prothorax; prothorax quadrangular, on middle a yellow line; abdomen black, segments margined behind with yellow; feet yellowish-brown, knees yellowish; caudal setæ fuscous, yellow at base; ♀ antepenultimate ventral segment truncated, two very short setiform appendages? (from the figure); wings grayish-hyaline, before the apex clouded with fuscous; maxillary palpi very long.

(Description taken from the description and figure of Pictet.)

Length to tip of wings 53 millim. Expanse of wings 86 millim.

Hab. The locality unknown. Vienna Museum. It has the *habitus* of an American insect. I have not seen the typical specimen: from the figure and description of Pictet it seems to be a *Pteronarcys*. The generic character is derived from the length of

the maxillary palpi: it is, however, of doubtful importance. The species, perhaps, is *P. biloba*.

* * Wings with few, but rather regular, transverse veins.

PERLA Geoffroy.

Wings veiny, transverse veins few, very regular; posterior wings with the anal space large, plicated; palpi setaceous; two caudal setæ.

○ The submarginal, apical space of the anterior wings with some transverse veins. Subgenus *Acroneuria* Pictet.

1. P. abnormis!

Perla abnormis Newm.! Entom. Mag. V, 177. Pict. Perl. 180, 12. Walker! Catal. 147, 21.—*P. arenosa* Pict.! Perl. 178, 11; tab. x, fig. 1—2. Walker, Catal. 147, 19.—*P. pennsylvanica* Ramb.! Neuropt. 456, 13. —*P. internata* Walker! Catal. 152, 41.—*P. trijuncta* Walker! Catal. 153, 43.—*P. sonans* Barnston, Newport, Linn. Trans. XX, 447.

Yellowish-fuscous; the head broader than the prothorax, luteous, obscure in the middle; the antennæ fuscous, the second articulation and sometimes the following ones luteous; prothorax narrower posteriorly, the angles acute, sides straight, surface rugulose, the middle line scarcely more distinct; the feet luteous, knees fuscous; abdomen beneath yellowish, setæ fuscous, densely pilose; ♂ last ventral segment large ovate, with a round, polished spot; ♀ antepenultimate ventral segment slightly rounded, produced; wings subhyaline, veins clay-yellow; the vein accessory to the subcosta four-forked, some transverse veins.

Length to tip of wings, ♂ 27; ♀, 35 millim. Alar expanse, ♂ 50; ♀, 60 millim.

Hab. St. Lawrence River (Barnston); Philadelphia, Pa. (Pictet); Trenton Falls (Osten Sacken); Georgia (Abbot); South Illinois (Robt. Kennicott); Maryland (Uhler).

I have seen a specimen from Mexico (Muehlenpford, in the Berlin Museum), which was paler, with many transverse veins, and the antepenultimate segment produced elliptically. Is it a distinct species?

2 P. ruralis!

P. ruralis Hagen!

Testaceous; head broader than the prothorax, a curved fuscous line in front; antennæ fusco-testaceous, the second articulation and some of the following ones luteous; the prothorax quadrangular, short, equal, rugulose, angles rather obtuse; feet testaceous, knees fuscous; abdomen beneath yellowish, setæ yellowish, behind the base banded with fuscous, hardly pilose; ♀ antepenultimate ventral segment a little rounded, produced, before the apex a linear transverse tubercle; wings sub-hyaline, the veins luteous; anterior wings with the subcostal accessory veinlet five-branched, transverse veins very numerous. (Female.)

Length to tip of wings 31 millim. Alar expanse 57 millim.

Hab. St. Louis.

3. P. arida!

Perla arida Hagen!

Yellowish-fuscous; head broader than the prothorax, yellowish, clouded with fuscous anteriorly; antennæ fuscous, second articulation yellowish; prothorax narrower posteriorly, angles acute, sides straight, rugulose, middle line yellowish; the feet luteous, knees fuscous; the abdomen beneath luteous; setæ pilose, yellow, articulations of the tip fuscous at their apex; ♂ last ventral segment large, ovate; ♀ antepenultimate ventral segment with a middle lamina narrow at base and at the apex two-lobed; wings subhyaline, veins fuscous; anterior wings with the subcostal accessory vein three-branched, transverse ones few.

Length to tip of wings 23 ♂, 28 ♀ millim. Alar expanse 43 ♂, 53 ♀ millim.

Hab. New York, Philadelphia.

Is this not *P. arenosa* Pictet, tab. x, fig. 2, from Philadelphia?

○ ○ Submarginal space of the anterior wings not charged with transverse veins.

a. Subcostal accessory veinlet of the anterior wings with four incurved branches. Subgenus *Isogenus* Newm. *Nephelion* Pict.

4. P. frontalis!

Isogenus frontalis Newm.! Entom. Mag. V, 178. Mag. Nat. Hist. III, 25.—*Nephelion frontalis* Pict. Perl. 172, 8; tab. viii, fig. 10—11. Walk.! Catal. 144, 10.—*Perla bicaudata* Kirby, Fn. Bor. Am. 252.

Blackish-fuscous; head hardly broader than the prothorax, an occipital spot and a frontal one in the shape of a V, yellow; prothorax quadrangular, rugulose, sides straight, a yellow stripe upon the middle, angles acute; feet yellowish-fuscous, knees blackish-brown banded with yellow; abdomen fuscous, apex beneath yellowish; the setæ pilose, luteous; ♀ antepenultimate ventral segment slightly, but broadly excised; wings hyaline, anterior ones with a medial costal, hardly conspicuous, fuscous cloud; veins blackish-brown. (Female.)

Length to tip of wings 24 millim. Alar expanse 42 millim.

Hab. St. Martin's Falls, Albany River, Hudson's Bay (Barnston); Latitude 68° (Richardson); Trenton Falls, and Ohio (Schaum).

I possess a ♀ specimen, taken at the same place, Ohio, most resembling this, but the incisure of the antepenultimate segment differs a little; being narrower and longer. Perhaps distinct.

5. P. clio.

Isogenus clio Newm. Mag. Nat. Hist. new ser. III, 86, 7. Walker Catal. 146, 17.

"Fuscous, head laterally around the eyes yellowish; prothorax with a median, longitudinal, yellow line; abdomen testaceous."—*Walker.*

Hab. Georgia (Abbot).

Unknown to me.

6. P. drymo.

Isogenus drymo Newm. Mag. Nat. Hist. new ser. III, 86, 6. Walker Catal. 146, 18.

"Fuscous, head testaceous, clypeus and a quadrate spot behind it fuscous; prothorax fuscous, marked with two large bright testaceous spots; base of the femora paler."—*Walker.*

Hab. Georgia (Abbot).

Unknown to me.

7. P. aurantiaca!

P. aurantiaca Hag.!

Orange-luteous; head with two ocelli; prothorax narrower behind, sides straight, surface rugulose, angles acute; last ventral segment short, produced in the middle; wings subhyaline, orange-yellowish, veins orange; accessory veinlet three-branched.

Length to tip of wings 18 millim. Alar expanse 35 millim.

Hab. Mexico. The unique type is very defective.

a a Accessory subcostal veinlet of the anterior wings, two-branched. Subgenus *Perla* Pictet. (Apical costal space with some transverse veins.)

8. P. dorsata.

Sialis dorsata Say, Godman's Western Quart. Rep. 1823, II, 164, 1.

"Black varied with rufous; head blackish, with about six blacker spots; beneath pale yellowish, labrum pale; palpi black; prothorax blackish, with impressed blacker lines, anterior and posterior incisures and dorsal vitta rufous, angles rather prominent, a pale obsolete line from the base of the thorax to the abdomen, beneath yellowish, disk of the segments black; trochanters yellowish; abdomen black, segments above with yellow posterior margins, venter pale yellow; nervures of the wings deep black."—*Say* (amended, *Uhler*).

Length to tip of wings 50 millim. (1¾ inches). Alar expanse 80 millim.?

Hab. Ohio River, Pittsburg; "common in May."—*Say.*

Unknown to me.

9. P. Coulonii.

Perla Coulonii Pictet, Perl. 212, 22; Pl. x, fig. 4. Walk. Catal. 150, 32.

"Black; head broad, the sides and occiput luteous; beneath luteous; the prothorax large, fuscous, very rugulose, the disk obscurer; abdomen paler fuscous; setæ rather short, fuscous; wings fusco-hyaline, veins fuscous, stout."—*Pict.*

Length to tip of wings 46 millim. Alar expanse 77 millim.

Hab. United States. Unknown to me. Perhaps *P. dorsata?*

Is it different from Walker's species, captured at the "Mackenzie and Slave Rivers?"

10. P. immarginata.

Sialis immarginata Say, Godman's West. Quart. Rep. II, 164, 2.

"Black varied with yellow, or yellow varied with black; eyes deep black-brown; prothorax transversely quadrangular, posterior angles a little rounded, disk a little rugose, with impressed irregular lines, an impressed dorsal line, and each side of it a slightly

arcuated one; beneath yellow; wings obscure, veins fuscous, immarginate.

"It varies very much in coloring, being generally entirely yellow beneath, and sometimes upon the tergum. The thorax has sometimes a yellow dorsal line, and sometimes a black one."—*Say.*

Length to tip of wings ♀ 30 millim. ("more than one inch"). Male smaller.

Hab. Ohio River: "common in May" (Say). Unknown to me.

Perhaps a unique male from Washington (Osten Sacken) belongs to this species.

11. P. lurida!

Perla lurida Hag.!

Testaceous, varied with yellowish; head hardly broader than the prothorax, yellowish, a broad fuscous stripe upon the middle excised in front and drawn out into a semilunar form posteriorly; antennæ testaceous; prothorax quadrangular, narrower posteriorly, testaceous, rugulose, sides a little incurved, anterior angles acute, posterior ones a little rounded; feet testaceous, knees fuscous, underneath yellowish; body beneath yellowish, setæ testaceous-yellow, base of the venter pale yellow; antepenultimate ventral segment a little produced, triangularly emarginate in the middle; wings testaceo-hyaline, veins fusco-testaceous. (Female.)

Length to tip of wings 33 millim. ♀ Alar expanse 62 millim.

Hab. New Orleans (Pfeiffer).

12. P. lycorias!

Perla lycorias Newm. Mag. Nat. Hist. ser. 2, III, 85. Pict. Perl. 214. Walk. Catal. 152, 40.

Testaceous-yellow; head broader than the prothorax, orange-yellow, a transverse, trilobed, brownish-testaceous band; anteriorly and posteriorly clouded with fuscous; antennæ brownish-testaceous, base yellowish, first articulation brownish-black; prothorax quadrangular, hardly narrower posteriorly, sides straight, angles acute; its color orange-yellow, with fuscous rugulæ, a middle line brownish-black; feet testaceous, knees and the tibiæ externally, fuscous; beneath yellowish, setæ fusco-testaceous, pilose; ♂, last ventral segment larger, rounded, furnished with a transverse, ovate, flat, polished tubercle; ♀, antepenultimate segment with an elliptical middle lobe; wings subhyaline, veins fusco-testaceous.

Length to tip of wings 21—28 millim. Alar expanse 42—52 millim.

Hab. New York (Trenton Falls). Is this the true *P. lycorias* Newm. ?

13. P. tristis!

Perla tristis Hag.!

Fusco-piceous; head broader than the prothorax, fusco-piceous, two points anteriorly and two upon the middle yellow; antennæ piceous, base beneath and second articulation paler; prothorax quadrangular, posteriorly narrower, fusco-piceous, rugulose, shining, sides a little oblique, posterior angles hardly rounded, anterior ones acute; the feet luteous, exteriorly fusco-piceous; abdomen piceous, base beneath yellow; setæ fuscous; ♂ last ventral segment larger, triangular, incurved; ♀ antepenultimate segment truncated; wings smoky brownish, costal margin obscurer, veins fuscous. (Male small.)

Length to tip of wings 17—25 millim. Alar expanse 32—44 millim.

Hab. Trenton Falls, New York; Washington (Osten Sacken).

14. P. capitata.

Perla capitata Pict. Perl. 214, 23; tab. xviii, fig. 4, 5. Walker Catal. 150, 31.

Fuscous; head broader than the prothorax, luteous, the disk and anterior portion black; prothorax quadrangular, narrower behind, rugulose, fuscous; abdomen luteous, obscurer at the apex; setæ luteous, apex fuscous; feet luteous, exteriorly and tarsi fuscous, knees with a black band; wings fusco-hyaline, veins black-brown. ♂ (The diagnosis is from the figure and description of Pictet.)

Length to tip of wings 20 millim. Alar expanse 29 millim.

Hab. United States. Unknown to me.

15. P. annulipes!

Perla annulipes Hagen!

Brown varied with yellow; head a little broader than the prothorax, brown, occiput, two median spots and a transverse fascia in front yellow; antennæ dusky, two basal articulations pale yellow; prothorax quadrangular, narrower behind, sides oblique, angles acute; brown, rugulose upon the surface, shining, anteriorly

margined with yellow; feet yellow, a fuscous ring upon the femora at base, knees, tibiæ externally and tarsi fuscous; abdomen above brown, segments margined with yellow; beneath yellow, middle of the base obscure; setæ yellow at base (the remainder is broken off); ♀ antepenultimate ventral segment, middle lobe, short, broad, rounded, infuscated; wings grayish-subhyaline, costal margin a little yellowish, veins testaceous. (Female.)

Length to tip of wings 18 millim. Alar expanse 34 millim.

Hab. Washington (Osten Sacken, 1857). Is this *P. capitata* Pictet?

16. P. postica!

Perla postica Walker Catal. 144, 11.

Black; head equal to the prothorax, black, a spot upon the occipital middle, which is hastiform and sometimes two anteriorly orange-yellow; antennæ black; prothorax transverse, quadrangular, short, black, rugulose, an orange stripe upon the middle, sides straight, angles acute; feet brownish-black; abdomen black, beneath in the middle yellowish; setæ black; ♂ last ventral segment larger, ovate, fuscous; ♀ antepenultimate segment large, triangularly ovate, fuscous; wings grayish-subhyaline, veins fuscous.

Length to tip of wings 15—20 millim. Alar expanse 28—34 millim.

Hab. Louisiana (Schaum); Mackenzie River (Richardson).

I do not know whether this is the same with Walker's species or not. It is some time since I examined his specimens in the British Museum.

The words in Mr. Walker's diagnosis, "prothorax produced into an acute angle, or short horn on each side by the foreangle," are erroneous, and they are accordingly omitted here.

17. P. olivacea!

Perla olivacea Walk. Catal. 144, 12.

Fuscous; head hardly broader than the prothorax, fuscous, fulvous in front with a large occipital, trilobed, transverse spot; antennæ fuscous, fulvous at base; prothorax transverse, quadrangular, shorter, fuscous, rugulose, a broad, yellow middle stripe; sides straight, anterior and posterior margin a little rounded; the feet fuscous, beneath and tibiæ luteous; abdomen fuscous; setæ luteous,

pilose; ♂ with last ventral segment luteous, larger, oval; wings small, shorter than the abdomen, subhyaline, veins fuscous.

Length of body 9 millim.

Hab. Arctic America. St. Martin's Falls, Albany River (Barnston). Is this Walker's species?

18. P. media.

Perla media Walker Catal. 145, 13.

Black; head broader than the prothorax, black, the sides, posterior margin and two spots yellowish-brown; prothorax quadrangular, black, rugulose, with a middle sulcus; narrower posteriorly, anterior angles acute, posterior ones rounded; wings subcinereous, veins black.

Length to tip of wings? 20 millim. Alar expanse 36 millim.

Hab. St. Martin's Falls, Albany River, Hudson's Bay (Barnston). Unknown to me. Is it not *P. immarginata?*

19. P. æthiops.

Perla æthiops Walk. Catal. 154, 45.

Black; head hardly broader than the prothorax, black; prothorax quadrangular, narrower behind, black, subrugulose, subsulcated, sides convex, angles subacute; wings blackish-fuscous, veins black. (The diagnose is taken from that of Walker.)

Length to tip of wings? 24 millim. Alar expanse 40 millim.

Hab. Mexico (Hartweg). Unknown to me. Is it not *P. tristis?*

20. P. cincta.

Perla cincta Pict. Perl. 229; tab. xx, fig. 5. Walk. Catal. 156, 50.

Black varied with yellow; head broader than the prothorax, black, in front yellow; antennæ black, the basal article fuscous; prothorax transverse, angles rounded, sides straight, surface subrugose, black, margined with yellow, the anterior margin broader, upon the middle a yellow stripe; abdomen and setæ fuscous; the feet luteous, streak of the femora, and the knees black, tibiæ at base and tarsi black; wings tinged with yellowish, semihyaline, veins orange-yellow. (From the figure and description of Pictet.)

Length to tip of wings 30 millim. Alar expanse 50 millim.

Hab. Vera Cruz. Unknown to me.

21. P. nigrocincta!

Perla nigrocincta Pict.! Perl. 236, 34; tab. xxii, fig. 5—8. Walker, Catal. 158, 56.

Yellow varied with fuscous; head as wide as prothorax, yellow, disk brownish-black, only two ocelli; antennæ fuscous; prothorax yellow, rugulose, externally the half each side fuscous, sulcus upon the middle fuscous; posteriorly narrower, in front and sides rounded, anterior angles subacute, posterior ones rounded; feet yellow, knees, tibiæ and tarsi externally fuscous; abdomen yellow; setæ yellow; ♂ last ventral segment large, ovate; wings fusco-subhyaline, costal margin somewhat yellowish, veins testaceous. (Male.)

Length to tip of wings 18 (—22) millim. Alar expanse 33 (—41) millim.

Hab. Mexico (Koppe); Cordova (Saussure).

22. P. dilaticollis!

Perla dilaticollis Burm.! II, 880, 7. Pict.! Perl. 240, 36; tab. xxiii, fig. 5—10. Walk. Catal. 158, 58.

Yellow varied with brown; head wide as the prothorax, yellow, in front clouded with fulvous: ocelli only two, black; the antennæ brown, the base luteous; prothorax narrower behind, anteriorly rounded, rugulose, brown, a broad, yellowish middle vitta, sides oblique, anterior angles rounded; feet yellowish, knees and tibiæ externally a little infuscated; abdomen and setæ yellowish; ♂ last ventral segment large, ovate; ♀ antepenultimate ventral segment truncate? wings testaceo-subhyaline, veins testaceous, accessory subcostal vein incurved.

Length to tip of wings 10—13 millim. Alar expanse 20—27 millim.

Hab. Mexico; Columbia; Brazil; North America (Museum Vienna). I have not seen the Mexican specimens.

23. P. litura.

Perla litura Pict. Perl. 242, 37; tab. xxiv, fig. 1—3. Walk. Catal. 159, 59.

Yellow varied with brown; head as wide as the prothorax, brown, margined with black, only two ocelli, antennæ blackish; prothorax brown, rugulose, a broad middle yellow stripe; broad, narrower behind, in front rounded, anterior angles rounded, sides oblique; feet yellowish, knees, tibiæ externally and apical ring, and tarsi fuscous; abdomen and setæ yellow; wings grayish-subhyaline, costal margin obscurer, veins fuscous. (Taken from the figure and description of Pictet.)

Length to tip of wings 11 millim. Alar expanse 20 millim.

Hab. Mexico. I have not seen it. Is it not *P. dilaticollis?*

24. P. similis!

Perla similis Hagen!

Fuscous varied with fulvous; head as wide as the prothorax, fuscous, sides fulvous, antennæ blackish-fuscous; prothorax quadrangular, transverse, rugulose, fuscous, a broad fulvous stripe upon the middle, sides straight, anteriorly and posteriorly somewhat rounded, angles subacute; feet fuscous; abdomen fuscous, apex above bright fulvous; yellowish-brown below; setæ blackish-fuscous; ♀ antepenultimate ventral segment truncated; wings smoky-hyaline, costal margin obscurer, veins deep fuscous. (Female.)

Length to tip of wings 14 millim. Alar expanse 23 millim.

Hab. Pennsylvania and Maryland (Uhler).

25. P. xanthenes.

Perla xanthenes Newm. Entom. Mag. V, 178. Mag. Nat. Hist. 2d ser. III, 35, 3. Pict. Perl. 245, 38; tab. xxi, fig. 3, 4. Walker, Catal. 159, 60.

Body entirely pale yellow; head hardly broader than the prothorax, with a fuscous spot, ocelli black; prothorax quadrangular, rugulose, posteriorly a little narrower, angles subacute; apex of the femora hardly annulated with fuscous; apex of the abdomen fuscous; wings pale yellowish, subhyaline; veins pale yellow. (Taken from the figure and description of Pictet.) (Female.)

Length to tip of wings? 27 millim. Expanse of wings 47 millim.

Hab. Pennsylvania; Georgia (Abbot).

26. P. annulicauda.

Perla annulicauda Pict. Perl. 249, 40; tab. xxii, fig. 1—4. Walk. Catal. 160, 64.

Lurid; head as wide as the prothorax, lurid, disk obscurer, anteriorly a pale sinuated nebulous stripe, ocelli (two?) posterior ones banded with black, prothorax short, rugulose, lurid, rugulæ paler; sides and angles rounded; the abdomen luteous, the setæ luteous annulated with black; the feet luteous, femora above, knees, base and apex of the tibiæ and apex of the tarsi fuscous; wings yellowish-gray, semihyaline, apex of the costal margin obscurer, veins luteous. (Taken from the figure and description of Pictet.)

Length to tip of wings 22 millim. Alar expanse 29—38 millim.
Hab. Mexico; Brazil. Unknown to me.

27. P. costalis.

Perla costalis Pict. Perl. 264, 48; tab. xxiv, fig. 4. Walk. Catal. 162, 70.

Fuscous; head broader than the prothorax, fuscous, in front rufescent; antennæ black; prothorax quadrangular, black, middle reddish-rugulose, angles rounded, behind narrower; abdomen yellowish-fuscous; the setæ fuscous, at base luteous; feet yellowish, apex of the femora, tarsi, black, tibiæ exteriorly fuscous; wings fuscous, veins black, costal one golden-yellow. (Taken from the figure and description of Pictet.)

Length to tip of wings? 18 millim. Alar expanse 27 millim.
Hab. Vera Cruz. Unknown to me.

28. P. occipitalis!

Perla occipitalis Pict. Perl. 254, 43; tab. xxvi, fig. 1—3. Walker, Catal. 160, 65.

Yellow varied with brown; head broader than the prothorax, ocelli black, only two in number, surface between the ocelli blackish-brown, remaining surface yellow, in front clouded with fulvous; antennæ brown, their base luteous, with the basal articulation blackish-fuscous at base, and at its apex luteous; prothorax brown, rugulose, posteriorly narrower, anteriorly somewhat rounded, sides a little oblique, anterior angles acute; feet yellow, exteriorly fuscous; abdomen and setæ yellowish; ♀ antepenultimate ventral segment truncated; wings testaceo-subhyaline, costal space yellowish, veins testaceous; accessory vein direct. (Female only seen.)

Length to tip of wings 15 millim. Alar expanse 27 millim.
Hab. Philadelphia; New York; Washington (Osten Sacken); Maryland (Uhler).

Very similar to *P. dilaticollis.* In the specimen from Maryland the prothorax has a middle yellow stripe, anteriorly and posteriorly broadened.

29. P. picta.

Perla picta Pict. Perl. 261, 47; tab. xxvii, fig. 3, 8.

Yellowish-fulvous; the head broader than the prothorax, luteous, a spot upon the middle triangular, and another irregular, between the ocelli black, ocelli three; antennæ yellowish, apex

fuscous; prothorax at sides black, with a luteous medial line or broader fascia; quadrangular, sides almost straight, angles somewhat rounded; abdomen and setæ luteous; wings hyaline, hardly obscured, veins fuscous. (Taken from the figure and description of Pictet.)

Length to tip of wings 16—18 millim. Alar expanse 27—32 millim.

Hab. North America. Unknown to me and a somewhat doubtful species.

30. P. placida!

Perla placida Hag.!

Yellowish-fulvous; the head a little broader than the prothorax, luteous, in front clouded with fulvous, a large discoidal, quadrangular black spot, three ocelli; antennæ fuscous, base yellow, basal article fuscous above; prothorax rugulose, brown, posteriorly a little, anteriorly somewhat rounded, sides a little oblique, anterior angles acute; the feet luteous, knees subfuscous; the abdomen and setæ luteous; ♂ last ventral segment larger, ovate; ♀ antepenultimate one truncate; wings pale testaceo-hyaline, costal space yellowish, veins testaceous.

Length to tip of wings 10—12 millim. Alar expanse 17—23 millim.

Hab. New York; Washington (Osten Sacken, 1857). Very similar to *P. occipitalis*.

31. P. ephyre!

Chloroperla ephyre Newm.! Mag. Nat. Hist. 2d ser. III, 87, 5. Pictet. Perl. 283, 3. Walk.! Catal. 168, 91.

Yellowish fulvous; head broader than the prothorax, yellowish-fulvous, ocelli three, joined together by a V-shaped brownish-black line, antennæ fuscous, base hardly yellow, basal articulation obscurer; prothorax yellowish-fulvous, rugulose, hardly narrower behind, anteriorly somewhat rounded, sides almost straight, anterior angles acute; feet yellowish, knees exteriorly a little dusky; abdomen yellowish; setæ yellowish, at apex fuscous; ♀ antepenultimate ventral segment truncated; wings pale testaceo-hyaline, veins luteous, costal space slightly yellowish.

Length to tip of wings 15 millim. Alar expanse 25 millim.

Hab. Georgia (Abbot); New York; New Orleans; Berkeley Springs, Virginia (Osten Sacken).

32. P. clymene.

Chloroperla clymene Newm. Mag. Nat. Hist. 2d ser. III, 87, 4. Pict. Perl. 283, 4. Walk. Catal. 167, 87.

"Head yellow, eyes and ocelli black; wings lightly tinged with fuscous, nervures all fuscous."—*Newman.*

Alar expanse 26 millim.

Hab. Georgia (Abbot). Unknown to me. Does it belong here?

Subgenus *Chloroperla* Pictet. (Costal, apical space with one transverse vein.)

33. P. Guerinii.

Perla Guerinii Pict. Perl. 279, 55; tab. xxx, fig. 6—8. Walk. Catal. 164, 77.

Black; head as wide as the prothorax, black, a stripe upon the occiput yellow; prothorax quadrangular, anteriorly narrower, rugulose, a stripe upon the middle yellow; feet brown, femora and tibiæ with a longitudinal line, and tarsi, black; abdomen black, the last segment whitish-gray; setæ fuscous, pilose, base whitish; wings dusky subhyaline, veins dusky. (From the figure and description of Pictet.)

Length to tip of wings 15 millim. Alar expanse 27 millim.

Hab New Orleans. Unknown to me.

34. P. maculata.

Perla maculata Pict. Perl. 280, 56; tab. xxx, fig. 9. Walker, Catal. 164, 78.

Black; head as wide as the prothorax, yellow, disk broadly black; prothorax black, with a yellow middle line, posteriorly narrower, sides rounded; wings dusky, costal space obscurer, veins black. (From the figure and description of Pictet.)

Length to tip of wings 11 millim. Alar expanse 20 millim.

Hab. Philadelphia. Unknown to me.

35. P. decolorata.

Perla decolorata Walker, Catal. 170, 98.

Pale testaceous; head a little broader than the prothorax, pale testaceous, with an irregular, discoidal, black spot; prothorax quadrangular, subrugose, a large fuscous spot each side, sides straight, angles subacute; wings hyaline, veins black, testaceous at base. (From the description of Mr. Walker.)

Alar expanse 27 millim.

Hab. Great Bear Lake (Richardson). Unknown to me.

36. P. decisa.

Perla decisa Walker, Catal. 170, 99.

Ferrugineous, shining; head broader than the prothorax, testaceous, antennæ fuscous; prothorax square, rugulose, angles subacute; wings gray, veins black.

Alar expanse 25 millim.

Hab. St. Martin's Falls, Albany River, Hudson's Bay (Barnston).

37. P. bilineata!

Sialis bilineata Say, Godman's Western Quarterly Reporter, II, 165, 4.—*Chloroperla transmarina* Newm.! Mag. Nat. Hist. ser. 2, III, 87, 3. Newm.! Ent. Mag. V, 499. Walk. Catal. 161, 89. Pictet. Perl. 283, 2. *Perla picta* Walk. Catal. 161, 169.

Pale fuscous, varied with yellow; head broader than the prothorax, with three ocelli; surface yellow, two, anteriorly conjoined, semicircular, fuscous lines upon the disk, two straight fuscous lines before the discal ones; antennæ yellowish, apex fuscous, basal articulation dusky; prothorax quadrangular, yellow, rugulose, each side with a broad fuscous stripe, sides straight, posteriorly hardly narrower, angles acute; the feet luteous, knees, and exteriorly obscurer; the abdomen and setæ luteous, ♀ antepenultimate ventral segment rounded at apex; wings grayish-hyaline, exteriorly tinged with yellow, veins testaceous. (Female.)

Length to tip of wings 12 millim. Alar expanse 21 millim.

Hab. Canada; Trenton Falls, New York; Ohio (Schaum); "Cincinnati, 15th May: not rare" (Say).

38. P. severa!

Perla severa Hag.!

Pale yellow; head hardly broader than the prothorax, pale yellow, three black ocelli; antennæ pale yellow, apex obscurer; prothorax quadrangular, rugulose, pale yellow, a narrow brown stripe upon the middle, sides straight, angles obtuse, rounded; feet yellowish, exteriorly obscured, tarsi blackish fuscous; abdomen ——; wings hyaline, veins fuscous, base and disk partly pallid.

Length to tip of wings 13 millim. Alar expanse 23 millim.

Hab. Island of Unga, Russian America.

39. P. citrinella.

Perla citrinella Newp. Proc. Linn. Soc. I, 388, 6. Newp. Trans. Linn. Soc. XX, 540, 1. *P. citrinella* Walk. Catal. 169, 97.

Pale luteous; the head as wide as the prothorax, ocelli fuscous; antennæ fuscous, pale at base; prothorax not broader behind, luteous, subrugulose, the anterior margin and middle line blackish, angles obtuse, sides incurved; wings hyaline, veins pale. (From the description of Mr. Walker.)

Length to tip of wings(?) 13 millim. Alar expanse 23 millim.

Hab. St. Martin's Falls, Albany River, Hudson's Bay (Barnston); Nova Scotia (Redman.)

Unknown to me. The description of Mr. Newport differs a little: "antennæ entirely black." The description of Mr. Walker was drawn from the typical specimen. Is it an *Isopteryx?*

40. P. imbecilla.

Sialis imbecilla Say, Godman's West. Quart. Rept. II, 165, 3.

Pale green, immaculate; head with three fuscous ocelli, antennæ rather obscurer, pilose; prothorax transversely oval, rugulose; wings greenish-white. (Taken from the description of Mr. Say.)

Length to tip of wings 9 millim. Alar expanse 16 millim.

Hab. Ohio River at Cincinnati. Common in the middle of May (Say). Unknown to me. Is it an *Isopteryx?*

ISOPTERYX Pict.

Wings with the transverse veins rare, almost absent; no basal space to the posterior wings; palpi setaceous, last articulation shortest.

1. I. cydippe!

Chloroperla cydippe Newm. Mag. Nat. Hist. ser. 2, III, 88, 8. Pict. Perl. 317. Walk. Catal. 168, 88.—*Chl. sulphurea* Fitch! (Collection of de Selys Longchamps.)

Pale yellow, immaculate; head hardly broader than the prothorax, three black ocelli; antennæ nigro-fuscous, base pallid: prothorax transversely oval, subrugulose, angles rounded; feet pale, tarsi nigro-fuscous; wings greenish-hyaline, veins pale.

Length to tip of wings ♂ 7 ♀ 9 millim. Alar expanse ♂ 13 ♀ 16 millim.

Hab. Georgia (Abbot); Trenton Falls, New York; Washington (Osten Sacken, Asa Fitch). Is it not *P. imbecilla?*

CAPNIA Pictet.

Wings veiny, transverse veins very few and very regular; anal area of the posterior wings large, plicate; palpi filiform, last joint ovate, longer than the preceding one; two setæ.

1. C. pygmaea!

Semblis pygmaea Burm.! II, 874, 1.(♁)—*Capnia pygmaea* Pictet! Perl. 324, 2; tab. xl, fig. 1—3. Walk. Catal. 175, 2.—*Perla nivicola* Fitch! Winter Insects of E. New York, 5, 3.

Black, shining, with gray hairs; articulations of the antennæ long; prothorax rounded, subrugulose, in front with an impressed, curved line; feet black, tibiæ brown, at the apex pitchy, tarsi fuscous; abdomen black; setæ with somewhat near 20 articulations, black, apex fuscous; ♂ wings rudimentary; ♀ wings pale, veins fuscous; penis of the male long; to the back of the abdomen two tubercles, placed before the apex of the penis.

Length to tip of wings 4½ ♂, 9 ♀ millim. Alar expanse 16 ♀ millim.

Hab. Pennsylvania (Zimmerman); Newfoundland. "New York, common in February."—*Dr. Fitch.*

Is not *Capnia vernalis* Newport, this same species?

2. C. necydaloides!

Capnia necydaloides Pict.! Perl. 326, 3; tab. xl, fig. 4—5. ♀; Walker, Catal. 175, 3.

Black, shining; articulations of the antennæ long; prothorax rounded, subrugulose, anteriorly an impressed, curved line; feet black, tibiæ brown, piceous at the apex, tarsi fuscous; the abdomen luteous, the apex black; setæ black, with 13—18 articulations, the apex fuscous; ♂ wings rudimental; ♀ wings a little longer than the abdomen, pale, the veins stout, black; penis shorter than in the preceding species; abdomen having one dorsal tubercle before the apex of the penis.

Length to tip of wings ♂ 4, ♀ 6½ millim. Alar expanse 11½ millim.

Hab. North America (Pictet); Washington, 20th December (Osten Sacken).

3. **C. minima!**

Perla minima Newp.! Proc. Linn. Soc. I, 388, 2. Trans. Linn. Soc. XX, 450, 2. Walk.! Catal. 183, 19.

Black, shining; antennæ moniliform; prothorax narrower than the head, subquadrate, sides straight, angles acute; feet blackish-fuscous; abdomen black (setæ with 13 articulations, Newp.); ♂ wings rudimental; ♀ wings pale, veins black; penis ♂ very short; abdomen having no dorsal tubercle before the apex of the penis.

Length to tip of wings ♂ $2\frac{1}{2}$; ♀ 6 millim. Alar expanse, 7 millim.

Hab. St. Martin's Falls, Albany River, Hudson's Bay; April (Barnston).

I possess only the male; the remainder of the description is from Newport and Walker.

4. **C. vernalis!**

Capnia vernalis Newp. Proc. Linn. Soc. 388, 3. Trans. Linn. Soc. XX, 451, 3. Walk. Catal. 176, 8. *Nemoura tenuis* Walk.! Catal. 182, 13.

Black, shining, sparingly pilose; antennæ moniliform; prothorax narrower than the head, rounded, rugulose; feet, abdomen, and setæ blackish-fuscous; setæ with somewhat near 20 articulations; wings pallid, veins fuscous; wings with the form and reticulation of *Nemoura* (subgenus restricted); penis rather long; no dorsal tubercle before the apex of the penis.

Length to tip of wings 6—7 millim. Alar expanse 10—12 millim.

Hab. St. Martin's Falls, Albany River, Hudson's Bay (Barnston).

I possess a male and female from the British Museum; they are certainly *N. tenuis* Walker, but I do not know whether the specimens described in the same place and taken in New York, belong here. Nor have I quoted here Newport's species *C. vernalis*, without some doubt. But not finding his typical specimens in the British Museum, I am rather inclined to believe that Mr. Walker has erroneously united them to *N. tenuis*. *N. tenuis* Pictet is very different.

† † No abdominal setæ.

* Second articulation of the tarsi equal to the others.

TAENIOPTERYX Pictet.

Wings a little involuted, veined, transverse veins very scarce, rather regular; anal area of the posterior wings large, plicated; palpi filiform, the last article ovate; no abdominal setæ; tarsi with three long, equal articles.

1. T. fasciata!

Semblis fasciata Burm.! II, 875, 6. Pict.! Perl. 359, 5, tab. xlvi, fig. 4, 5. Walker, Catal. 179, 5.

Black, with gray pile; head hardly broader than the thorax, in front and at the eyes rufous, tubercles flat, polished, anteriorly with two parallel grooves; antennæ fuscous, the basal articulation black; prothorax broader behind, rugulose, sides oblique, posterior margin rounded, anterior angles subacute, tubercles a little shining, near the anterior margin a transverse, biarcuated sulcus, two closely approximated, linear, parallel discoidal tubercles, at the posterior margin a transverse sulcus; feet yellowish-brown, femora exteriorly, tibiæ at base and the tarsi blackish-brown; abdomen black, shining, ♀ appendix broad, yellow, triangular, beneath excavated, the apex narrow, rounded, incurved; ♂ appendix yellow, lanceolate; wings subhyaline, a gray transverse band upon the middle and another at the apex; veins fuscous.

Length to tip of wings 11—13 millim. Alar expanse 23—25 millim.

Hab. Philadelphia, Pa.; Washington, April (Osten Sacken).

2. T. similis!

Taeniopteryx similis Hagen!

Black, shining; head broader than the prothorax, shining, hardly rufous anteriorly, antennæ black; prothorax short, broad, sides oblique, posterior margin rounded, anterior angles rounded, posterior ones acute, anterior margin subreflexed, very rugulose; feet brown, femora exteriorly and the tarsi blackish-brown; abdomen black, shining; the last ventral segment truncated; wings subhyaline, with three broad gray bands, the extreme one is apical, veins fuscous. (Female.)

Length to tip of wings 8 millim. Alar expanse 14 millim.

Hab. Washington, May (Osten Sacken).

I possess males from Washington, April (Osten Sacken), with the femora unarmed, the ventral appendage narrow, oval, concave, and with the sculpture of the front, anteriorly, a little different. Is it a new species?

3. T. frigida!

Tæniopteryx frigida Hagen!

Black, grayish-pilose; head hardly broader than the prothorax, in front fuscous, tubercles flat, polished; anteriorly with two parallel furrows; antennæ black; prothorax hardly broader posteriorly, sides straight, anterior and posterior margin subrotund, anterior angles rounded, posterior ones square, with a few flat, polished tubercles, near the anterior margin a transverse biarcuated sulcus, at the posterior margin a transverse one; feet yellowish-brown, femora exteriorly, tibiæ at base and the tarsi blackish-brown; abdomen black, shining; wings subhyaline, a gray band upon the middle and another at the apex, veins fuscous.

Length to tip of wings 15 millim. Alar expanse 25 millim.

Hab. Maryland (Uhler).

Is this not *N. nivalis* Fitch, Winter Ins. 6, 4. Walk. Catal. 190, 48? It is certainly a *Tæniopteryx*, and perhaps *T. fasciata* Burm.?

4. T. maura!

Tæniopteryx maura Pict.! Perl. 361, 6; tab. xlvi, fig. 6.

Black, opaque; head equal to the prothorax, rugulose, occiput punctated, antennæ blackish-brown; prothorax broader behind, sides sinuated, oblique, anterior angles rounded, posterior ones subacute, the anterior and lateral margins a little recurved, tubercles very few, polished; feet whitish-pilose, femora black, tibiæ luteous; abdomen black; wings grayish-hyaline or fuscous, veins fuscous; male with shorter wings, the ventral appendage oblong, concave. The same sex has a robust tooth upon the middle of the femora beneath.

Length to tip of wings, ♂ 9; ♀ 15 millim. Alar expanse ♀ 27 millim.

Hab. Philadelphia, Pa.; Washington, April (Osten Sacken). Common.

5. **T. glacialis!**

Nemoura (*Brachyptera*) *glacialis* Newp.! Proc. Linn. Soc. I, 389, 4. Trans. Linn. Soc. XX, 451. Walk.! Catal. 192, 53. *N. maura* Walk.! Catal. 179, 7. (Female.)

Allied to *T. maura;* differs in having the occiput verrucose, and the prothorax smoother; the wings in the males rudimentary, the femora unarmed, the ventral appendage quadraugular, flatter.

Length to tip of wings 9—15 millim. Alar expanse 27 millim.

Hab. St. Martin's Falls, Albany River, Hudson's Bay (Barnston).

* * The second article of the tarsi small, shorter than the others.

NEMOURA Pictet.

Wings veiny, flat, transverse veins few, very regular, veins of the pterostigma forming an X; anal area of the posterior wings large, plicate; no setæ; the second articulation of the tarsi short.

1. **N. completa.**

Nemoura completa Walk. Catal. 191, 52.

Black, shining; head broader than the prothorax, upon the disk a luteous spot; prothorax quadrangular, equal, sides straight, angles subacute, surface subrugulose, a smoother sulcus upon the middle; feet ferruginous; wings hyaline; anterior ones with a band upon the middle and another at apex fuscous, veins fuscous. (From the description of Mr. Walker.)

Length to tip of wings 8? millim. Alar expanse 14 millim.

Hab. Nova Scotia (Redman). Unknown to me. May it not belong to *Tæniopteryx?*

2. **N. albidipennis!**

Nemoura albidipennis Walk. Catal. 191, 51.

Piceous, shining; head broader than the prothorax; antennæ fuscous; prothorax quadrangular, sides straight, angles subacute, anterior margin a little recurved, disk with a few tubercles; feet pale luteous, apex of the femora and base of the tibiæ fuscous; abdomen yellowish-fuscous; wings hyaline, veins fuscous, a little margined with fuscous.

Length to tip of wings 9 millim. Alar expanse 16 millim.

Hab. Washington (Osten Sacken); Nova Scotia (Redman) Is not the ferruginous-colored species of Mr. Walker distinct from this?

3. N. perfecta!

Nemoura perfecta Walk.! Catal. 191, 51.

Black, shining; head broader than the prothorax, antennæ black, prothorax narrower behind, sides oblique, anterior angles rounded, the anterior margin a little recurved, disk with a few tubercles; feet testaceous, femora exteriorly and the tarsi brownish-black; wings clouded with fuscous, broadly margined with fuscous, veins fuscous.

Length to tip of wings 8 millim. Alar expanse 14 millim.

Hab. Trenton Falls (Osten Sacken); Nova Scotia (Redman). It may be different from Mr. Walker's species.

I possess an individual of the European *N. variegata*, labelled "Philadelphia," but the label is very doubtful.

LEUCTRA Stephens.

Wings veiny, involuted when in rest, transverse veins very few, very regular, veins of the pterostigma simple (*i. e.*, not forming an X); anal area of the posterior wings small, plicate; caudal setæ absent; the second articulation of the tarsi short.

1. L. tenuis!

Nemoura tenuis Pict.! Perl. 375, 10; tab. xlix, fig. 1—3.

Fuscous, opaque, head a little broader than the prothorax; antennæ fuscous; thorax quadrangular, sides straight, angles subacute, disk with three elevated lines, the middle one straight, the others subincurved; feet fulvous, abdomen fuscous; wings subhyaline, a little ciliated, veins fulvous.

Length to tip of wings 7 millim. Alar expanse 12 millim.

Hab. Philadelphia; Washington (Osten Sacken); Sharon Springs, New York, in August (Osten Sacken).

2. L. ferruginea!

Nemoura ferruginea Walk.! Catal. 183, 18.

Fusco-ferruginous, somewhat shining; head a little broader than the prothorax; antennæ ferruginous; prothorax a little

broader in front, quadrangular, sides a little convex, anterior angles somewhat rounded; disk with three straight elevated lines, the outer ones shorter; feet and abdomen ferruginous; wings subhyaline, a little ciliated, veins ferruginous.

Length to tip of wings 8 millim. Alar expanse 14 millim.

Hab. Nova Scotia (Redman).

Fam. V. EPHEMERINA.

Body elongated, conical; prothorax of moderate size; antennæ small, subulate; parts of the mouth rudimentary, connate; caudal setæ two or three, long, slender; wings unequal, posterior smaller, or sometimes absent; transverse veins few or numerous; tarsi four- or five-articulated.

EPHEMERA Linn.

Three long and equal caudal setæ; wings four, transverse veins very numerous; eyes remote, in the males simple.

1. E. decora!

Ephemera decora Walk.! Catal. 537, 7. Male Imago.

♂ *Imago.* Rather luteous, apex of the antennæ black; the head, thorax, and abdomen each side with a fuscous fascia, that of the abdomen broader, exteriorly serrated; beneath yellowish, abdomen bilineate; anterior feet very long, luteous, the apex of the femora, base and apex of the tibiæ and apex of the tarsal articulations fuscous; posterior feet (partly destroyed) luteous; setæ luteous, long, the articulations fuscous; wings yellowish-hyaline, veins fuscous, partly margined with fuscous, anterior ones with some discoidal fuscous spots. Female paler, feet shorter, wings more hyaline.

Length of body 11 millim. Alar expanse 26 millim. Setæ 25 millim.

Hab. New Haven; Canada (Barnston); Chicago (Osten Sacken).

Does *E. guttulata* Pictet. Ephem. 135, 4, tab. iv, fig. 4, belong here? I have never seen it, and the locality is unknown. The figure and description agree, but yet, the wings are more spotted.

2. E. simulans.

Ephemera simulans Walk.! Catal. 536, 5.

Piceous; feet fulvous, anterior ones obscurer; setæ pale pice-

ous, pubescent, longer than the body; wings subcinereous, the anterior ones maculated and subfasciated with fuscous, the apex and posterior margin not maculated; veins cloudy. (From Mr. Walker's description.)

Length of body 12 millim. Alar expanse 31 millim. Setæ 14 millim.

Hab. St. Lawrence River.

Is it not a female subimago? I have seen the specimen described and noted "that it was allied to *E. vulgata*, but smaller."

3. E. hebes.

Ephemera hebes Walk. Catal. 538, 8. ♀ Subimago.

Piceous; antennæ black; feet testaceous, anterior ones fuscous; setæ fusco-testaceous; wings cinereous, veins black. (From Mr. Walker's description.)

Length of body 9 millim. Alar expanse 22 millim.

Hab. St. Johns, Newfoundland.

The specimen described is in the British Museum.

4. E. natata!

Palingenia natata Walk.! Catal. 551, 13. ♀ Subimago.

Fusco-testaceous; antennæ black; abdomen interruptedly bivittated with fuscous; setæ pilose, fulvous, banded with fuscous, a little shorter than the body; feet testaceous, tibiæ and tarsi fuscous; wings subcinereous, veins black and black-banded, except at the apex and posterior margin; the anterior ones with three or four discoidal fuscous spots.

Length of body 15 millim. Alar expanse 38 millim. Setæ 15 millim.

Hab. St. Martin's Falls, Albany River, Hudson's Bay (Barnston); Chicago (Osten Sacken).

5. E. pudica!

Ephemera? pudica Hagen! ♀ Subimago.

Luteous; thorax spotted with fuscous; abdomen with the posterior margin, exteriorly, of the middle dorsal segments black; feet luteous, the knees and a ring upon the middle of the femora fuscous; wings grayish-hyaline, longitudinal veins yellow, transverse ones fuscous, banded with gray; transverse discoidal veins a little irregular.

Length of body 12 millim. Alar expanse 40 millim.

Hab. Washington (Osten Sacken, 1858).

Are there three setæ? The unique specimen is very much mutilated; but it has the *facies* of an Ephemera.

PALINGENIA Burm.

Three setæ, the middle one short, in the males sometimes, almost absent; wings four, transverse veins very numerous; eyes remote, simple.

1. P. hecuba!

Palingenia hecuba Hagen! ♀ Imago.

Luteous, spotted with fuscous; head blackish-fuscous, apex of the antennæ pale; prothorax shining fuscous, broad, narrower anteriorly; abdomen luteous, above blackish-fuscous; setæ thick, whitish-gray, the middle one of equal thickness with the others (partly destroyed); base of the feet luteous (the feet are wanting in the specimen); wings large, opaque, grayish-rosy, the costal margin a little obscurer, veins gray.

Length of body 22 millim. Alar expanse 78 millim.

Hab. Vera Cruz (Sallé). Collection of de Selys Longchamps.

The largest species yet known. The wings are opaque, but yet it is an imago; and it has a mass of eggs in the vulvar aperture.

2. P. alba!

Batis alba Say, Long's Narrative, Appendix, II, 305, 3.

Milk-white; vertex fuscous; prothorax transverse, quadrangular, in front truncated, yellowish-white; anterior feet grayish-fuscous, the others white; wings whitish, anterior margin grayish.

Length of body 11 millim. Alar expanse 22 millim.

Hab. North Red River (Robt. Kennicott); Winnipeg River (Say).

"This insect appears in immense numbers;" for a more particular account see Long's Narrative, as quoted above. I have seen only a mutilated specimen.

3. P. puella.

Palingenia puella Pictet, Ephem. 145, 2; tab. xi, fig. 4.

Milky-whitish; ocelli black; prothorax transverse, short, ante-

riorly produced in the middle; apex of the feet brownish, femora pale; wings whitish, costa a little obscurer. (From the figure and description of Pictet.)

Alar expanse 26 millim.

Hab. New Orleans. Not seen by me. Is it *P. alba* Say?

4. P. bilineata!

Bætis bilineata Say, Long's Exped. II, 303, 1. *P. limbata* Pictet, Ephem. 146, 3; tab. xii.

Imago ♂. Fulvous, antennæ pale, basal articulation obscurer; head dusky in front, beneath yellow; prothorax compressed in the middle, above triangularly tuberculated, each side with a fuscous stripe; abdomen fulvous, spotted with fuscous; each side with a medial fuscous stripe composed of oblique striæ, margins of the segments fuscous; anterior feet fuscous, basal articles of the tarsi yellow, posterior feet yellow, unguiculi fuscous; setæ yellowish, long, apex of the articles annulated with fuscous; intermediate seta very short; anal appendages yellow, the apex fuscous; penis two-parted, fuscous, apex incurved, oval; wings hyaline, anterior ones with the costal margin fulvous, veins black, some transverse blackish-banded veins; posterior wings with the apex hardly clouded, transverse discoidal veins banded with blackish-fuscous. Imago ♀. Pale yellow; tarsal unguiculi fuscous; abdomen with a fuscous apical band in the middle and interrupted ones on both sides; wings yellowish-hyaline, costal margin yellowish, longitudinal veins yellowish, transverse ones black.

Subimago ♀. Similar to the imago, the abdomen above obscurer, wings opaque.

Length of body, ♂ 16; ♀ 18. Subimago, ♀ 22 millim. Alar expanse, ♂ 34; ♀ 40. Subimago, ♀ 48 millim. Length of caudal setæ, ♂ 46. Subimago, ♀ 25 millim.

Hab. St. Peters River, "common" (Say); N. Red River (Robt. Kennicott); Maryland (Uhler); Philadelphia; Washington (Osten Sacken); St. Louis. The specimens from Washington are yellower.

5. P. limbata!

Palingenia limbata Serv. Guér. Icon. Regn. Animal. Ins. tab. lx, fig. 7. *Ephemera limbata* Ramb. Neuropt 295, 4. Walker, Catal. 548, 3. *Pal. viridescens* Walk.! Catal. 550, 11. Fem. Subimago. *Bætis angulata* Walk.! Catal. 564, 28. Male imago.

♂ Imago. Fulvous, spotted with fuscous; antennæ gray, basal article brownish-black; head dusky in front, beneath yellow; prothorax narrowed in the middle, above triangularly tuberculated, each side with a fuscous stripe confluent upon the disk; abdomen brownish-black, dorsum each side with an interrupted yellow stripe; anterior feet entirely fuscous, posterior ones brownish-yellow, unguiculi fuscous; setæ long, fuscous, the apex of the articles with a very small whitish annulus; intermediate seta very short; anal appendages fuscous; penis two-parted, fuscous, apex unguiculated, recurved; wings subhyaline, anterior ones with the costal margin fuscous; veins black, some transverse ones bounded with black; posterior wings margined exteriorly with fuscous, discoidal transverse veins covered with black.

♂ Subimago. Like the imago, but with the body opaque, grayer, the feet obscurer, the wings opaque gray, the anterior ones hardly colored upon the costal margin, the posterior ones more broadly margined.

♀ Imago. Similar to the male; the whole body paler, more fulvous, setæ and feet paler; the intermediate seta very short; the anterior wings have the costal margin paler.

♀ Subimago. Similar to the imago, the body opaque; brownish-gray, feet and setæ brownish-black, wings opaque gray, the anterior ones with the costal margin of the same color, the posterior ones with a brownish-black margin.

I possess another female subimago, a younger specimen. The body, feet, and setæ are much diluted and pale-colored, the margin of the posterior wings is of the same color, pale. It is hardly different.

Length of body, ♂ 17. ♂ ♀ Subimago, 21. ♀, 29 millim. Alar expanse, ♂ 34. ♂ ♀ Subimago, 42. ♀, 46 millim. Length of setæ, ♂ 42. ♂ ♀ Subimago, 18. ♀, 20 millim.

Hab. New Orleans (Pfeiffer); Ohio (Schaum); St. Louis; Chicago (Osten Sacken); St. Martin's Falls, Albany River, Hudson's Bay (Barnston); Canada (*id.*)

Male imagines from Chicago seem to differ a little, the colors are much paler, the apex of the penis is incurved, the basal half of the antennæ is black, the setæ yellowish and the apex of the articulations has a fuscous ring. *P. bilineata* from Washington and *P. limbata* from New Orleans certainly are distinct species; the species from Chicago is colored very much like *P. limbata*, but

the penis is incurved. *P. bilineata* Say, from N. Red River (determined by Mr. Uhler), is colored more like *P. limbata* from Chicago; Mr. Walker's species require a new examination.

6. P. occulta.

Palingenia occulta Walk.! Catal. 551, 12. ♂ ♀, Imago.

Testaceous; antennæ black, the base testaceous; sides of the mesothorax fuscous; abdomen obscurer, interruptedly bivittated with fuscous; setæ not longer than the body, testaceous, a little hairy; tarsi and anterior feet fuscous; wings subcinereous, veins black, basal ones testaceous; anterior wings yellowish at base, with the costal margin brownish. (From the description of Mr. Walker.)

Length of body 21—25 millim. Alar expanse 41—50 millim. Setæ 19 millim.

Hab. Arctic America, Lakes Winnipeg and Superior (Richardson).

The typical specimens are similar to *P. viridescens*, but smaller, and the posterior wings are scarcely margined exteriorly.

7. P. bicolor.

Palingenia bicolor Walk.! Catal. 552, 15. ♀ Subimago.

Ferruginous; thorax each side below, with a black spot; abdomen fuscous, beneath paler; setæ long, hairy, testaceous; feet yellow, anterior ones brownish testaceous, base of the tarsi whitish; wings cinereous, the margin pilose, the veins black, margined with fuscous.

Length of body 12 millim. Alar expanse 27. Setæ 24 millim.

Hab. St. Martin's Falls, Albany River, Hudson's Bay (Barnston).

8. P. decolorata!

Palingenia decolorata Hagen!

Luteous; head brownish-black, antennæ pale; prothorax narrower anteriorly; anterior feet blackish, posterior ones luteous; mesothorax yellowish-fuscous; abdomen luteous, sides striped with obscure fuscous, setæ luteous, intermediate very short; wings yellowish-hyaline, veins luteous, the subcosta fuscous. (Imago.)

Length of body 16 millim. Alar expanse 30 millim. Setæ 30? millim.

Hab. Mexico; Matamoras, Tamaulipas. Common.

I have seen many specimens, but all of them in alcohol and mutilated, and the colors were probably a little changed.

I have had a large species from New Grenada in alcohol, but the specimen is very much damaged.

BAËTIS Leach.

Abdomen furnished with two setæ; wings four, transverse veins numerous; eyes simple; in the male approximate, large.

1. B. interpunctata!

Baëtis interpunctata Say, Jour. Acad. Philad. VIII, 41, 1. Walker, Catal. 562, 23.

Yellowish white tinged with green; head yellowish, vertex with a lateral black point, front with an arcuated black line; ocelli with a black ring around each, apex of the antennæ black; prothorax with a black line each side: mesothorax tinged with brown; feet greenish, the four anterior femora with a black ring upon the middle and apex, apex of the posterior ones fuscous; abdomen with the apex ferruginous, the posterior margin of the dorsal segments black; setæ pale; wings hyaline, the anterior margin greenish, the transverse veins black, an abbreviated, submarginal, medial black line. Imago and subimago, male and female.

Length of body 8 millim. Alar exanse 18—26 millim. Setæ ♂ 20, ♀ 14.

Hab. Indiana (Say); Washington, Trenton Falls (Osten Sacken); Chicago, Alleghany Mountains, Va. (Osten Sacken).

2. B. flaveola!

Baëtis flaveola Pict. Ephem. 186, 12, tab. xxiii, fig. 4. Walker! Catal. 559, 12.

Yellow, eyes black; wings yellowish-hyaline, transverse veins black; posterior femora with a black point; abdominal segments margined with black; setæ yellowish. (From the figure and description of Pictet. (Female imago.)

Length of body 8 millim. Alar expanse 22 millim. Setæ 9 millim.

Hab. Tennessee (Pœppig, Museum of Vienna); St. Martin's Falls, Albany River, Hudson's Bay (Barnston).

I have seen a specimen (♀ Imago) from the Vienna Museum; it may be the one described by Pictet (although the setæ are longer, 14 millim.). As that female pertains, undoubtedly, to *B. interpunctata*, probably, therefore, *B. flaveola* is nothing but a female *B. interpunctata* Say. On account of a slight fold in the anterior margin of the wings the submarginal line is seen with difficulty.

I have seen a mutilated, smaller, female subimago from Tennessee (with the wings expanding 18 millim.), which may be a distinct species.

3. B. obesa.

Baëtis obesa Say. Journ. Acad. Philad. VIII, 43, 4. Walk. Catal. 563, 26.

Subimago. Black, livid; wings brownish-black, with many small, transverse hyaline spots or abbreviated lines, a large, hyaline, oblique semifascia about the middle on the anal margin; posterior ones, with many transverse, abbreviated, hyaline lines not attaining to the apical margin; feet pale yellow, incisures of the tarsi black; abdominal segments margined with rufous; setæ very short, pilose, annulated with black. (From Say's description.)

Length of body 8 millim.

Hab. Indiana (Say).

4. B. fusca!

Baëtis fusca Walker! Catal. 568, 38.

Imago ♂ ♀. Piceous, beneath ferruginous; antennæ black; abdomen ferruginous, beneath fulvous; setæ testaceous, subannulated with fuscous, three times the length of the body; feet testaceous, the anterior ones fuscous; wings hyaline, anterior ones with the costal margin at the apex fuscous. (From Mr. Walker's description.)

Length of body 8 millim. Alar expanse 20 millim. Setæ 25 millim.

Hab. St. Martin's Falls, Albany River, Hudson's Bay (Barnston).

I saw the specimen in London, and noted at that time that it was closely allied to *B. flaveola;* the specimen from Nova Scotia belongs to *P. concinnus* Walk. Perhaps a male imago, from Washington (Osten Sacken), and one from Chicago, belongs here.

5. B. debilis.

Baëtis debilis Walker, Catal. 569, 39.

Ferruginous; abdomen obscurer; setæ testaceous, much longer than the body; feet pale testaceous; wings subhyaline, veins testaceous. ♀. (From the description of Mr. Walker.)

Length of body 6 millim. Alar expanse 17. Length of setæ 8 millim.

Hab. Nova Scotia (Redman).

6. B. arida.

Baëtis arida Say, Jour. Acad. Philad. VIII, 42, 2. Walk. Catal. 562, 24.

Reddish-brown; head whitish, varied with ferruginous, vertex each side, with a small black point; eyes rufous, with a whitish vitta; incisures of the abdomen much obscurer; setæ and posterior feet greenish-white; wings immaculate. (From the description of Say.)

Length of body 10 millim.

Hab. Indiana (Say). A female imago, from Washington, may belong here; the specimen is mutilated.

7. B. verticis!

Baëtis verticis Say, Jour. Acad. Philad. VIII, 42, 3. Walk. Catal. 562, 25.

Yellowish-white; vertex ferruginous; thorax with two ferruginous vittæ, which are confluent anteriorly, but obsolete posteriorly; setæ a little longer than the body, the incisures black; feet whitish, anterior femora at the apex ferruginous, apex of the anterior tibiæ and incisures of the tarsi fuscous; wings hyaline, veins exclusive of the marginal ones, black. (From the description of Say.) ♂ Imago.

Length of body 8 millim. Alar expanse 21 millim. Setæ 24 millim.

Hab. Indiana (Say); Maryland (Uhler).

Two specimens from Maryland agree with the description, except in the color of the veins of the wings; the marginal ones are black, or rather fuscous. Is the description good? It should be observed that the species of *Baëtis* are very difficult to separate, and perhaps some species heretofore described may be only synonyms of others. A further acquaintance is necessary. A male and female from Dalton, Georgia (Osten Sacken), and Washington (*id.*)

are possessed by me, perhaps the true *B. verticis:* is it not *B. flaveola* Pict.?

8. B. canadensis!

Baëtis canadensis Walk. Catal. 569, 40.

Testaceous; vertex and disk of the thorax ferruginous; abdomen with the margins of the segments piceous; feet pale, femora fuscous, incisures of the tarsi black; wings hyaline, costal margin at the apex fuscous, veins black. (From Mr. Walker's description.)

Length of body 6 millim. Alar expanse 16 millim.

Hab. Canada (Barnston); Trenton Falls (Osten Sacken).

I have seen mutilated male and female imagines from Trenton Falls; are they the true *B. canadensis* Walker? A larger female, expanding 30 millimetres, is pale yellow, wings hyaline, veins yellow; the head and abdomen are wanting. In London I noted nothing about Mr. Walker's species, except that it was "allied to *B. flaveola;*" the variety there described is perhaps a female.

9. B. ignava.

Baëtis ignava Hagen. *Baëtis?* subimago, Walk. Catal. 571, 45.

Rufous; eyes broad, very prominent; thorax rufous; abdomen pale, reddish-gray; setæ thick; feet rufous; wings gray, opaque, the anterior ones narrow at base, veins bordered with fuscous.

Alar expanse about 25 millim.

Hab. Newfoundland.

Certainly a female subimago: the species is very doubtful; Walker assigns Madrid as the locality. I found the typical specimen labelled Newfoundland.

10. B. fuscata.

Baëtis fuscata Walk. Catal. 570, 41.

♀ Imago. Piceous, beneath ferruginous; antennæ black; sides of the thorax spotted with yellow; feet ferruginous, anterior ones piceous; wings hyaline, veins pale.

♀ Subimago. Obscure testaceous, setæ much paler, longer than the body; wings gray, opaque. (From Mr. Walker's description.)

Length of body 4—5 millim. Alar expanse 12—16 millim.

Hab. St. Martin's Falls, Albany River, Hudson's Bay (Barnston.)

11. B. invaria.

Baëtis invaria Walk. Catal. 568, 37.

♂ Imago. Pale ferruginous, beneath fulvous; antennæ black, at base ferruginous; feet testaceous; wings hyaline, transverse veins pale-whitish. (From Mr. Walker's description.)

Length of body 5—6 millim. Alar expanse 14—18 millim.

Hab. St. Martin's Falls, Albany River, Hudson's Bay (Barnston). Perhaps the male of the preceding species?

12. B. annulata.

Baëtis annulata Walk. Catal. 567, 34.

♂ Imago. Ferruginous, beneath testaceous; antennæ fuscous, base ferruginous; thorax with two testaceous stripes; abdominal segments with a testaceous, triangular spot each side; setæ whitish, the incisures black; feet whitish, banded with black; wings hyaline, veins black. (From Mr. Walker's description.)

Length of body 10 millim. Alar expanse 26 millim.

Hab. Trenton Falls, New York.

The mutilated specimens from Trenton Falls, cited under *B. canadensis*, may belong here, only they are of smaller size.

13. B. vicaria!

Baëtis vicaria Walk. Catal. 565, 30.

Imago. Ferruginous; antennæ black; sides of the thorax marked with yellow; segments of the abdomen banded with fuscous; setæ pale testaceous, subannulated, more than twice the length of the body; feet testaceous, femora with two black bands, anterior feet obscurer, wings hyaline, anterior ones with the costal and discoidal veins brownish-black, costal margin at the apex dusky, obscurer farther in. Imago and subimago, male and female.

Length of body 12 millim. Alar expanse 30 millim. Setæ 20—30 millim.

Hab. St. Lawrence River; Chicago; Washington; Savannah (Osten Sacken). Is it distinct from *B. canadensis?*

14. B. femorata.

Baëtis femorata Say, Godman's West. Quart. Rep. II, 162, 1.

♂. Fuscous, abdomen beneath whitish, setæ double the length of the body; femora with a middle and apical reddish-brown band;

wings snowy hyaline, veins clouded with fuscous, especially the basal, discoidal and apical ones.

♀ Fuscous, thorax yellowish, venter whitish; feet pale fuscous, a reddish-brown band upon the middle and apex; setæ nearly the same length as with the male; wings whitish, veins fuscous, clouded with fuscous. (From Say's description.)

Length of body 12 millim. Setæ 24 millim.

Hab. Cincinnati, Ohio (Say). Not common. Similar to the preceding species; it may be the same or *B. annulata.*

15. B. alternata!

Baëtis alternata Say, Long's Expedition II, 304, 2.

Fuscous; head in front and at sides whitish; thorax pale fuscous, in front yellowish, sides varied with yellow; feet pale ochraceous, an apical fuscous ring upon the femora; abdomen above fuscous, segments at base whitish, the two last with two whitish lines; venter whitish, each segment with two oblique lines and two intermediate points black; setæ whitish, regularly pointed with fuscous; wings hyaline, veins not margined. (From Say's description.)

Length of body 12 millim.

Hab. Northwest Territory (Say).

I would believe that a male imago and subimago and a female subimago from Maryland, communicated by Mr. Uhler, belong here, but the femora have a medial and apical band.

The ♂ subimago is paler; wings gray, opaque, veins a little clouded with fuscous. ♀ subimago obscurer, feet uniform fuscous; wings blackish-fuscous, posterior ones yellowish at base, veins not clouded.

Length of body 12 millim. Alar expanse 30 millim. Setæ ♂ 27 millim. Male and female, subimago, setæ 15 millim.

I saw subimagines like the female, from Washington (Osten Sacken).

16. B. luridipennis.

Baëtis luridipennis Burm. II, 801, 7. Pict. Ephem. 192. Walker Catal. 563, 27.

Fuscous; abdomen banded; wings lurid, veined with fuscous (Burm.) ♀ and subimago fulvous; antennæ fuscous; margins of the abdominal segments fuscous; setæ whitish, covered with

short pile, a little longer than the body; feet whitish, femora with a medial and apical fuscous band; wings hyaline, veins fulvous; anterior ones with the apex of the costal margin fulvescent.

Length of body 8 millim. Alar expanse 24 millim. Setæ 24 millim.

Hab. North America (Zimmerman); St. Martin's Falls (Barnston).

The specimens described by Mr. Walker are a female and subimago, not males as Walker contends, and, perhaps, belong to a different species; Burmeister's species is perhaps a subimago, and it may be of the preceding species.

17. B. basalis.

Baëtis basalis Walk. Catal. 565, 31.

Pitch-black; antennæ whitish; abdominal segments margined with testaceous; setæ whitish, the incisures annulated with black, twice as long as the abdomen; anterior wings hyaline, the costal veins clouded with fuscous, a middle marginal fuscous nebula; posterior wings fuscous, their apex hyaline. (From Walker's description.)

Length of body 12 millim. Alar expanse 28 millim. Setæ 22 millim.

Hab. Lake Winnipeg (Richardson). Is it not *B. luridipennis?*

18. B. noveboracana.

Ephemera noveboracana Lichtenstein, Catal. Mus. Holthuisen 1796, III, 193, 52.

Bisetous; wings fuscescent, the hind ones smallest; the abdomen fuscous, margined with luteous. (From the description of Lichtenstein.)

Hab. New York. Is it not *B. luridipennis?*

19. B. tessellata!

Baëtis tessellata Hagen!

Luteous; mesothorax each side with a fuscous line; abdomen, upon the segments, superiorly each side, with two fuscous triangular spots; setæ —? feet luteous, tarsi at the apex fuscous; wings opaque, gray, ciliated, veins lurid, many quadrangular, hyaline spots, posterior wings very small. Female, subimago.

Length of body 16 millim. Alar expanse 26 millim.

Hab. Puget Sound, Washington Territory.

I have examined one specimen, in alcohol.

I saw a species of *Baëtis* from Mexico (in the Berlin Museum), but the only specimen, a female, was very much mutilated.

POTAMANTHUS Pictet.

Three setæ; wings four, transverse veins numerous; eyes, in the male, double, large, approximate.

1. P. cupidus.

Ephemera cupida Say, Godman's West. Quart. Rep. II, 163, 1.

♂ Black; thorax blackish-gray, a broad dorsal stripe and each side an impressed line black; eyes large fuscous; abdomen black, the segments having the posterior margin pale, a dorsal line and each side an oblique obsolete line, whitish; setæ longer than the body; feet pale fuscous, tarsi black, anterior feet black; wings obscure, posterior ones pale, at tip obscurer.

♀ Like the male, but the eyes are small, remote; the abdomen black, ventral incisures pale; setæ a little longer than the body.

Length of body, ♂ 11, ♀ 8 millim. Length of setæ, ♂ 5, ♀ 10 millim.

Hab. Cincinnati, Ohio; 15th of May. Common (Say).

The form of the eyes demonstrates Mr. Say to have wrongly determined the sexes; therefore I have changed his female to male and his male to female. It will be observed that the length of the setæ given by Mr. Say disagrees with his description.

2. P. concinnus!

Palingenia concinna Walk.! Catal. 553, 17. (♁ Imago.) *Palingenia pallipes* Walk.! Catal. 553, 16. (♀ Imago and subimago.) *Baëtis tessellata* Walk.! Catal. 566, 32. (♀ Subimago.)

♂ Imago. Pitchy black; beneath partly ferruginous; antennæ black; setæ double the length of the body; intermediate one much shorter, luteous, incisures black; feet luteous, tarsi fuscous, anterior feet entirely piceous; wings hyaline, veins luteous, the apical veins much obscurer; costal margin of the anterior wings fuscous at the apex.

♀ Imago. Obscure ferruginous, beneath paler; disk of the

head piceous, antennæ black; sides of the thorax spotted with fulvous; setæ a little longer than the body; intermediate one shorter, luteous, incisures obscurer; feet luteous, anterior ones ferruginous; wings hyaline, veins fuscous, costal margin of the anterior ones lurid at the apex.

♀ Subimago. Whitish-testaceous, marked with fuscous; antennæ fuscous, testaceous at base; abdomen fuscous above; setæ testaceous, almost double the length of the abdomén; feet testaceous, femora banded with black, tarsi fuscous; wings subcinereous, opaque, veins testaceous, clouded with fuscous. (From Mr. Walker's description.)

Length of body 10 millim. Alar expanse 22—28 millim. Setæ, ♂ 27, ♀ 14 millim.

Hab. Nova Scotia (Redman); Washington, April (Osten Sacken).

Although I have examined the specimens described by Mr. Walker, the length of the setæ in the description of *B. tessellata* strikes me now as doubtful, as they should be shorter than those of the imagines.

3. P. nebulosus.

Palingenia nebulosa Walk.! Catal. 554, 18.

♂ Imago. Black; abdomen piceous, beneath fulvous; setæ testaceous, banded with fuscous; more than double the length of the body, intermediate one shorter; feet fulvous, anterior ones much obscurer; wings hyaline, veins fuscous, the anterior wings with a broad, longitudinal, fuscous band. (From Mr. Walker's description.)

Length of body 9 millim. Alar expanse 18 millim. Length of setæ 24 millim.

Hab. St. Martin's Falls, Albany River, Hudson's Bay (Barnston).

CLOË Leach.

Two setæ; four wings (sometimes the posterior ones are wanting), transverse veins few; eyes, in the males, double, large, approximate.

1. C. bioculata.

Cloëon bioculata Walk. Catal. 572, 1. (Complete synonymy.)

Eyes of the male obscure; mesothorax yellow; base and apex of the abdomen obscure; wings hyaline. (From Mr. Walker's description.)

Length of body 8 millim. Alar expanse 18 millim. Length of setæ 11—15 millim.

Hab. St. Martin's Falls, Albany River, Hudson's Bay (Barnston), Europe.

Further comparison will be necessary to show whether this be really the European species.

2. C. undata!

Cloë undata Pict. Ephem. 264, 10; tab. xli, fig. 6. Walk. Catal. 575, 10.

Pale luteous; feet yellowish, apex of the tarsi obscurer; setæ whitish, annulated with black; wings hyaline, anterior ones with the costal margin fuscous, marked with round, hyaline spots; clouded with fuscous upon the disk and posterior margin. ♂ Imago.

Length of body 7 millim. Alar expanse 15—19 millim. Setæ 10 millim.

Hab. Mexico; Cuba (Pictet); New York (Calverly).

I have seen but a single very much mutilated specimen.

3. C. mollis.

Cloë mollis Asa Fitch in de Selys Longchamp's collection.

Hab. United States. Unknown to me.

4. C. posticata.

Cloëon posticata Say, Godman's Western Quart. Rep. II, 162, 1.

♂ Imago. Greenish-white; eyes reddish-brown; thorax black, opaque; abdomen greenish-blue-hyaline, three apical segments fuscous; setæ long, white; feet white, anterior ones obscure at base; wings hyaline. (From Say's description.)

Length 8 millim. Length of setæ 19 millim.

Hab. Shippingsport, 21st May. Common (Say).

5. **C. unicolor!**

Cloë unicolor Hagen!

Entirely brassy-brownish; feet pale luteous; setæ white; wings hyaline. ♀ Imago.

Length of body 4 millim. Alar expanse 10 millim. Setæ 10 millim.

Hab. Washington (Osten Sacken). I have seen a female specimen from Porto-Rico, similar to this, with the thorax fulvo-aeneous: is it a different species?

6. **C. pygmaea!**

Cloë pygmaea Hagen!

Body brownish-gray; feet and setæ white; wings hyaline. ♀ Imago.

Length of body 3 millim. Alar expanse 6 millim.

Hab. St. Lawrence River, Canada (Osten Sacken).

7. **C. vicina!**

Cloë vicina Hagen!

Whitish-hyaline; thorax fulvous; eyes rufous; abdomen with the three apical segments fuscous above; setæ whitish; feet whitish, anterior ones fulvous at the base; wings hyaline. Male Imago.

Body yellowish-white; setæ and feet whitish; wings hyaline. Female Imago.

Length of body 4 millim. Alar expanse 10 millim. Length of setæ, ♂ 10, ♀ 6 millim.

Hab. Washington (Osten Sacken).

Schioedte, Berlin Ent. Zeit. J. III, p. 143, reports *Ephemera culiciformis* Linn., from Greenland; I have not seen the specimens.

CAENIS Stephens.

Setæ three; wings two, transverse veins few; eyes in the male very simple, remote.

1. **C. hilaris.**

Ephemera hilaris Say, Jour. Acad. Philad. VIII, 43. Walk. Catal. 583, 13.

Small, whitish; eyes black; thorax pale fulvous, beneath and sides with abbreviated obscure lines; apex of the abdomen, each

side, with three fuscous points; setæ long; wings whitish, the costal margin obscure. (From Say's description.)

Length of body 3 millim.

Hab. Indiana, 4th September (Say).

2. C. diminuta.

Caenis diminuta Walk.! Catal. 584, 14.

Fulvous; abdomen pale testaceous, setæ long, white; feet white, anterior ones banded twice or thrice with black; wings whitish, veins white, the costal margin blackish. Male. (From Mr. Walker's description.)

Length of body 3 millim. Alar expanse 6 millim. Length of setæ 12 millim.

Hab. St. John's Bluff, E. Florida (Doubleday).

This species is allied to *C. lactea* of Europe.

3. C. amica!

Caenis amica Hagen!

Head and prothorax fulvous, banded with black; antennæ whitish; mesothorax brassy-fulvous; feet whitish, anterior ones much longer, cinereous, the femora obscurer, posterior femora with a spot above upon the apex, black; abdomen pallid, varied with gray upon the back, segments with the apex and sides marked with black; setæ white; wings opaque, whitish-gray, the two costal veins black. (Male Imago.)

A male, taken at the same place, differs in its colors; the head is yellow banded with black; the thorax yellow; the feet white; the anterior femora and tibiæ have the apex gray; the abdomen is whitish-yellow. ♂ Imago. It may be a distinct species.

Length 2 millim. Alar expanse 4 millim. Length of setæ 6 millim.

Hab. Pennsylvania (Zimmerman, Berlin Museum).

Is it *C. hilaris?* Say?—he describes the eyes as double: are they really so? The genus *Caenis* has the eyes simple; nevertheless the description best suits *Ephemera hilaris* Say.

Fam. V. ODONATA.

Antennæ short, setiform; mouth not furnished with palpi; wings flat, reticulated; tarsi with three articles; second ven-

tral segment of the male furnished with accessory genital organs; abdomen with anal appendages; body elongated, narrow.

Tribe I. AGRIONINA.

Antennæ four-jointed; eyes distant; wings equal; abdomen cylindrical, slender; accessory genital organs, with the anterior hook connate, penis and vesicle separated; genital organs of the female vaginate.

Sub-Fam. I. CALOPTERYGINA.

Antecubital veins numerous.

CALOPTERYX Leach.

Wings very broad, densely reticulated, pterostigma absent in the males, that of the female irregular, areolate; basal space with no transverse veins; anal appendages of the male forcipate.

1. C. angustipennis!

Sylphis angustipennis Selys! (♂) Synops. Calopt. 9, 2. Monog. Calopt. 21, 2. Walker, Catal. 590, 2. *Sylphis elegans* Hag.! ♀. Synops. Calopt. 9, 1. Monog. Calopt. 20, 1. Walker Catal. 590, 1.

Brassy-green, shining; labrum and base of the antennæ yellowish; occiput with two acute tubercles; feet very long, with short cilia; abdomen long, slender, sides and venter rufescent (♀); wings narrow, long, hyaline, somewhat flavescent (♀), veins brassy-green; thorax rufescent, a dorsal green stripe, and a lateral, divided, broader blue one. (Female.) Thirty antecubital cross-nervules. No pterostigma.

Length of body, ♂ 67, ♀ 57 millim. Alar expanse 84 millim.

Hab. Georgia (Abbot); ♂. Collection of Dr. Hagen; locality unknown. ♀.

2. C. apicalis!

Calopteryx apicalis Burm.! Handbuch. II, 827, 8. Selys Synops. Calopt.! 9, 3. Monog. Calopt. 23, 3. Walk. Catal. 591, 3.

Brassy-green, shining; labium, antennæ, thoracic sutures and pectus black, or in part flavescent (♀); feet long, black, with long

cilia; wings narrow, hyaline, or with the apex narrowly fuscous. (Male.) Twenty antecubitals. Pterostigma absent.

Length of body 42 millim. Alar expanse 62 millim.

Hab. Philadelphia; Massachusetts (Scudder).

3. C. dimidiata!

Calopteryx dimidiata Burm.! Handb. II, 826, 16. Selys! Synops. Calopt. 10, 4. Monog. Calopt. 25, 4. Walk. Catal. 591, 4.—*Calopteryx cognata* Ramb.! Neuropt. 222, 6.—*C. syriaca* Ramb.! Neuropt. 223, 9. (In part. Male.)

Brassy-green or blue, shining; labium, antennæ, thoracic sutures, pectus, venter, and feet black; wings narrow, somewhat flavescent, the apex fuscous; pterostigma of the female snow-white. Male 30 antecubitals; female 20 antecubitals.

Length of body 40—45 millim. Alar expanse 54—56 millim. Pterostigma 1½ millim.

Hab. Kentucky; Georgia; Pilatka, St. John's River, Florida (Osten Sacken).

4. C. maculata!

Agrion maculata Beauv. 85; tab. vii, fig. 3.—*Calopteryx maculata* Burm.! Handb. II, 829, 17. Selys! Synopt. Calopt. 10, 5 Selys! Monog. Calopt. 27, 5. Walk. Catal. 592, 5.—*Calopteryx holosericeus* Burm.! Handb. II, 828, 13. Ramb. Neuropt. 226, 14.—*Calopteryx papilionacea* Ramb.! Neuropt. 222, 6.—*Calopt. opaca* Say, Jour. Acad. Philad. VIII, 32, 2.

Brassy-green or blue, shining; labium, antennæ, thoracic sutures, pectus, venter and feet black; abdomen with a dorsal yellow stripe upon the 8th to the 10th segment (♀); wings very broad, densely reticulated, black, sometimes with hyaline spots (♂), or clouded with fuscous and fuscous at the apex, with a snow-white pterostigma (female) 19—28 antecubitals.

Length 38—48 millim. Alar expanse 63—65 millim. Pterostigma 2—2½ millim.

Hab. Chicago (Osten Sacken); Maryland (Uhler); Washington; Trenton Falls (Osten Sacken); Philadelphia; Massachusetts; Dalton, Georgia (Osten Sacken); Carolina; Ohio; Pilatka, Florida (Osten Sacken).

A species common all over the Union.

5. C. virginica!

Calopteryx virginica Drury ed. Westw. I, 118; tab. xlviii, fig. 2. Selys! Synops. Calopt. 11, 6. Selys! Monog. Calopt. 29, 6. Walker Catal. 592, 6.—*Libellula virgo* Drury I, 114; tab. xlviii, fig. 2.—*Calopteryx materna* Say, Jour. Acad. Philad. VIII, 32, 1. ♀.—*Calopt. æquabilis* Say, l. c. VIII, 33, 2.—*Calopt. dimidiata* Ramb. Neuropt. 223, 5.

Brassy-green, shining; labium, antennæ, thoracic sutures, pectus, venter, and feet black; abdomen with the dorsal stripe, and venter with the segments 8—10 yellow; (♀) wings much narrower than in the foregoing species, hyaline, the base somewhat flavescent, the apex blackish-fuscous; pterostigma ♀ snow-white. 26—31 antecubitals. (From the description of De Selys.)

Length of body 50—52 millim. Alar expanse 70—72. Pterostigma 2 millim.

Hab. Virginia; Georgia; Massachusetts; Hudson's Bay.

6. C. splendens!

Calopteryx splendens Selys! Monog. Calopt. 36. 9. (With the complete synonymy.)

Blue (♂), or green (♀) brassy; base of the antennæ yellow; thorax with the second lateral suture yellow; feet black; abdomen with a dorsal yellow stripe upon the segments 8—10 ♀; wings broad, hyaline, a broad blue-black band ♂, or hyaline, with a snow-white pterostigma ♀.

Length of body 45—49 millim. Alar expanse 62—72 millim. Pterostigma 1—2 millim.

Hab. Georgia (Abbot).

I have seen a male from the collection of Abbot, in the Zurich Museum. Is it really from America?

A species common everywhere in Europe and Northern Asia.

Calopteryx virgo Fab. Fauna Groenland. 196, 152, is perhaps erroneously stated. Fabricius says that he only *saw it* once; but according to Schioedte, Berlin. Ent. Zeit. III, 142, it has not hitherto been discovered there.

HETAERINA Hagen.

Wings rather narrow, densely reticulated; pterostigma absent or very small, quadrangular; basal space reticulated; base of the wings, in the male, sanguineous.

* Pterostigma absent.

1. **H. septentrionalis!**

Hetaerina septentrionalis Selys! Synops. Calopt. 36, 43. Selys, Monog. Calopt. 119, 43.

Blackish-fuscous; head and thorax brassy, sides partly yellow; feet black; superior appendages of the tail semicircular, the apex, exteriorly dentated; the inferior ones long, cylindrical, at the apex thickened; wings hyaline, sanguineous at base, posterior ones with an apical, sanguineous spot. Male. (From the description of De Selys.)

Hab. Georgia (British Museum).

2. **H. californica!**

Hetaerina californica Hagen! Addit. Synops. Calopt. 6, 49, bis.

Brownish-black; head and thorax coppery; a humeral line and two lateral stripes, yellow; feet black, femora within and tibiæ without, yellow; abdomen brownish-black; superior caudal appendages a little incurved, a quadrangular tubercle upon the internal middle, and another smaller one at the apex; the inferior appendages much shorter, thickened at the base; wings hyaline, almost the basal half sanguineous, apex of the posterior ones dusky.

Length 44 millim. Alar expanse 60 millim.

Hab. Northern California.

3. **H. cruentata!**

Calopteryx cruentata Ramb.! Neuropt. 228, 19 ♂. Selys! Synops. Calopt. 39, 48. Selys! Monog. 127, 48; tab. xii, fig. 1. Walk. Catal. 625, 21.

Brownish-black; head coppery, epistoma blue (♂), or rufous (♀); dorsum of the thorax orange, with a medial broad black stripe; the sides orange, with a stripe and cuneiform black spot; feet black, tibiæ, exteriorly, yellow; female with the femora interiorly yellow; abdomen brownish-black; superior appendages forcipated, base interiorly, abruptly dilated, inferior appendages short, flat, truncated; wings sanguineous at base, the apex margined with fuscous (♂), or somewhat yellowish (female). 20—29 antecubital cross-nervules.

Length 42—50 millim. Alar expanse 56—68 millim.

Hab. Mexico; Venezuela; Martinique; Surinam; Brazil.

4. H. vulnerata!

Hetaerina vulnerata Hagen! Synops. Calopt. 40, 49. Selys! Monog. Calopt. 130, 49; tab. xii, fig. 2. Walker Catal. 626, 22.

Brownish-black; head brassy, epistoma black; thorax black, brassy, with a yellow humeral line, sides yellow, a broad stripe and a cuneiform mark, brassy black (♂); or orange; dorsum with a middle brassy-green stripe, sides with a narrow stripe and mark, brassy-green; feet black, femora inside and tibiæ outside yellow; abdomen brownish-black, superior appendages black, yellow at base, forcipated, at the internal base dilated; inferior ones short, cylindrical, broader at base; wings hyaline, sanguineous at base (♂), or anteriorly and at apex yellowish (female). 17—23 antecubital cross-nervules.

Length 42—50 millim. Alar expanse 60—66 millim.

Hab. Mexico; Columbia; Brazil.

* * Pterostigma very small, quadrangular.

5. H. americana!

Agrion americana Fab.! Ent. Syst. Suppl. 287, 3—4.—*Calopteryx americana* Burm.! Handb. II, 826, 4. Ramb. Neuropt. 227, 18.—*Hetaerina americana* Selys! Synopt. Calopt. 41, 50. Selys! Monog. Calopt. 131, 50; tab. xii, fig. 3. Walk. Catal. 627, 23.—*Lestes basalis* Say, Journ. Acad. Philad. VIII, 35, 2.

Fuscous, coppery (♂), or green-brassy (♀); thorax coppery, the sides with three yellow stripes (♂) or green-brassy, the sides with four yellow stripes, feet black, the femora inside and the tibiæ outside yellow; abdomen brassy-fuscous, the female has a dorsal interrupted yellow line; superior appendages yellow, with a black apex, forcipated, interiorly with a double tubercle upon the middle; inferior appendages short, truncated, cylindrical; wings hyaline, sanguineous at base (♂), or somewhat yellowish (♀); the pterostigma is yellow. 20—24 antecubital cross-nervules.

Length 43—46 millim. Alar expanse 54—62 millim.

Hab. Maryland; Massachusetts; Washington; Missouri; Indiana; Mexico; Brazil.

6. H. basalis!

Hetaerina basalis Hägen! Selys, addit. Synops. Calopt. 6, 50, bis.

Very much like *H. americana*, and perhaps a variety of it; it

differs, in the male, by having the basal sanguineous spot larger and exteriorly convex; the superior appendages have the middle tubercle triangular; the female has the yellow abdominal line hardly interrupted, the base of the wings yellowish-fuscous.

Length 43—46 millim. Alar expanse 54—62 millim.

Hab. Pecos River, Western Texas; Mexico; Cordova; Atlihuazan; Portrero (Saussure).

7. H. tricolor!

Calopteryx tricolor Burm.! Handb. II, 827, 7. Selys! Synops. Calopt.—*Hetaerina tricolor*, 42, 52. Selys! Monog. Calopt. 136, 52; tab. xii, fig. 5. Walk.! Catal. 629, 25.

Brownish-black; thorax with a humeral yellow stripe; sides yellow, with three brownish-black stripes; feet black, tibiæ exteriorly fuscous; abdomen brownish-black; appendages black, the superior ones forcipated, interiorly bi-excised; inferior ones short, cylindrical, the apex truncated; wings hyaline, anterior ones sanguineous at base, posterior ones fuscous at base, all the wings with a fuscous apical margin; pterostigma black (♂), or they are hyaline with the base somewhat yellowish, the pterostigma whitish-yellow (female). 20—24 antecubital cross-nervules.

Length 42—50 millim. Alar expanse 60—64 millim.

Hab. Philadelphia; Georgia.

The variety *H. limbata* Selys, from Georgia, is a little smaller, the apex of the wings is more infuscated.

8. H. titia!

Libellula titia Drury, II, 83; tab. xlv, fig. 3.—*Calopteryx titia* Burm.! Handb. II, 826, 3.—*Hetaerina titia* Selys! Synops. Calopt. 43, 53. Selys! Monog. Calopt. 138, 53. Walk. Catal. 630, 26.

Black; head, thorax, feet and abdomen black; superior appendages forcipated, interiorly with a basal tooth and middle dilatation; inferior ones short, cylindrical, obtuse; wings opaque fuscous, upon the middle obliquely hyaline; superior ones sanguineous at base; pterostigma yellow (♂), or they are opaque, fuscescent, with the apex of the superiors hyaline, the pterostigma white (♀). 19—22 antecubital cross-nervules. (From De Selys' description.)

Length 41—46 millim. Alar expanse 52—60 millim.

Hab. Mexico; Honduras.

9. H. macropus!

Hetaerina macropus Selys! Synops. Calops. 44, 54. Monog. Calopt. 141, 54. Walker, Catal. 631, 27.

Brownish-black; thorax coppery, a humeral yellow stripe, sides black, with three yellow stripes (♂); or yellow, dorsum each side with a green-brassy stripe, sides yellow, with two imperfect brassy-green stripes (♀); feet long, black; wings hyaline, with a basal fuscous stripe, anterior ones sanguineous at base, posterior ones rosy, with the pterostigma yellow (♂), or they are somewhat yellowish, with the pterostigma white (♀). 22—24 antecubital cross-nervules.

Length 36—44 millim. Alar expanse 52—54 millim.

Hab. Tampico, Mexico (Saussure); Honduras.

10. H. sempronia!

Hetaerina sempronia Hagen! Synops. Calopt. 45, 56. Selys! Monog. Calopt. 147, 56, tab. xii, fig. 7. Walker, Catal. 632, 29.

Black; head black, labrum and epistoma blue; thorax coppery, a humeral and three lateral lines, yellow; feet black; abdomen black; superior appendages black, forcipated, interiorly a medial dilatation, inferior ones short, with the apex obtuse; wings hyaline, sanguineous at base, posterior ones with an apical fuscous spot; pterostigma black. 27—28 antecubital cross-nervules (♂).

Length 46 millim. Alar expanse 58 millim.

Hab. Mexico (Deppe).

Sub-Fam. II. AGRIONINA.

Two antecubital transverse veins; wings petiolated.

Legion I. PSEUDOSTIGMATA.

Pterostigma irregular, areolate.

MEGALOPREPUS Rambur.

Wings broad, rounded, posterior margin densely reticulated, with many incurved branches; areoles pentagonal, the first sector of the triangle forked at apex; quadrangular space oblong.

1. **M. caerulatus!**

Libellula caerulata Drury, III, 75, tab. 1, fig. 1. *Megaloprepus caerulatus* Ramb.! Neuropt. 290, 1. *Libellula coerulea* Donovan, Nat. Reposit. iv, 110.

Black, beneath pale; thorax with a humeral line, and two inferiorly lateral stripes, pale yellow; feet black, femora inside and tibiæ outside pale yellow; wings broad, hyaline, before the apex a broad blue-black, transverse band, exteriorly, broadly margined with milk-white and emarginated; pterostigma large, oblong, black.

Length 90—115 millim. Alar expanse 115—180 millim.

Hab. Mexico (Saussure); Vera Cruz (Sallé); Guatimala; Choco, New Grenada (Schott); Honduras; Bogota, Columbia.

As yet, this is the most gigantic of the Odonata.

The variety *M. brevistigma* De Selys, from Bogota, differs in being of a smaller size, the pterostigma small and the band of the wings narrower.

PSEUDOSTIGMA De Selys.

Wings narrow, the reticulation of the posterior margin of the wings simple, the areoles tetragonal, regular; postcostal space with two series of areoles; pterostigma irregular; abdomen extremely long.

1. **P. accedens!**

Pseudostigma accedens Selys!

Black, brassy, beneath yellow; head black, each side in front slightly tinged with yellow; prothorax straight posteriorly, thorax, with the dorsum black, a yellow humeral stripe, broadly divided, sides yellow, with a broad black stripe above; pectus with a fuscous stripe; feet black, femora at base and beneath, and tibiæ extremely yellowish; abdomen black, with a steel blue reflection, the last segment having the apical half yellow; appendages black, the superior ones broad, incurved, interiorly excavated, the apex obliquely truncated; the inferior ones very small, acute; margin of the valves (♀) entire; wings hyaline, apex of the posterior ones entire, pterostigma black, quadrangular, of the posterior wings triangular (♂), apex of the wings with a narrow yellow spot anteriorly, pterostigma absent (♀).

Length 117—124 millim. Alar expanse 126—132 millim.
Hab. Mexico (Saussure); Vera Cruz (Sallé); Columbia.

2. **P. aberrans!**
Pseudostigma aberrans Selys!

Black, beneath yellow; labrum with a yellow middle spot, front anteriorly yellow, banded with black, and transverse; prothorax broadly emarginate posteriorly; thorax black, a humeral yellow, hardly cleft, line; sides with a black stripe; pectus with a black stripe in the middle; feet black, tibiæ exteriorly yellow; abdomen black, beneath yellow; margin of the valves (♀) dentated; wings hyaline, with a large, oval, apical spot; pterostigma absent (♀).

Length 112 millim. Alar expanse 131 millim.
Hab. Vera Cruz, Mexico (Sallé).

MECISTOGASTER Rambur.

Wings narrow; reticulation of the posterior margin simple; postcostal space having a single series of areoles; pterostigma irregular; abdomen extremely long.

1. **M. modestus!**
Mecistogastur modestus Selys!

Black, beneath yellowish; labrum yellow, banded with black; front yellow anteriorly; prothorax rounded posteriorly; thorax black, a humeral broad, yellow, obliquely divided stripe; sides with a black, oblique, entire stripe; feet black, femora exteriorly and base of the tibiæ yellowish; wings hyaline, pterostigma oblong, black, in younger individuals it is whitish (♂).

Length 84 millim. Alar expanse 84—91 millim.
Hab. Mexico (Saussure).

2. **M. ornatus!**
Mecistogaster ornatus Rambur! Neuropt. 288, 12.

Brassy-fuscous, beneath yellowish; head orange in front, base of the antennæ orange; prothorax rounded posteriorly; thorax brassy fuscous, a humeral divided stripe, a lateral stripe and a short mark near the wings, interrupted, yellow; pectus with a middle black stripe; feet fuscous, tibiæ exteriorly yellowish; abdominal appendages forcipated, yellow, at the apex black; wings

orange at the apex, margined interiorly with fuscous, the posterior ones whitish beneath the apex.

Length 87—102 millim. Alar expanse 97—116 millim.

Hab. Vera Cruz, Mexico (Sallé); Caracas, Venezuela; Surinam; Lima.

I possess a variety from Venezuela which has the apex of the wings green, beneath black (♂).

3. M. lucretia!

Libellula lucretia Drury, II, tab. xlviii, fig. 1. Sulze, Geschichte der Insect. tab. xxiv, fig. 4.—*Agrion lucretia* Burm.! II, 818, 1.—*Agrion amalia* Burm.! Handb. II, 818, 3.—*Agrion tullia* Burm.! II, 818, 2.—*Mecistogaster lucretia* Ramb. Neurop. 286, 7.—*Mecist. linearis* Ramb.! Neurop. 282, 1 (♁).—*Mecist. virgatus* Ramb.! Neurop. 284, 4 (♁ young).—*Mecist. filiformis* Ramb.! Neurop. 285, 6 (♀). —*Mecist. leucostigma* Ramb.! Neurop. 286, 8 (♀).

Brassy-black, beneath yellowish; head brassy-black above, a rufous stripe, each side at the ocelli; prothorax with two large rufous spots upon the posterior lobe; thorax, each side, with two approximated yellow lines; sides yellow, with a broad fuscous stripe; pectus yellow, a fuscous stripe upon the middle; feet brownish black, tibiæ exteriorly greenish-yellow; abdomen extremely long brassy-black, the three last segments yellow at sides, the apex of the last one yellow, excised; superior appendages livid, bent into a right angle, the apex subbifid, and interiorly a basal tooth; wings hyaline, posterior ones of the male having the apex dilated in front, rounded; pterostigma black, triangular:— in the younger ones pallid; *females*, pterostigma black, oblong, the apex of the wings subfuscous; the younger ones are yellow, with the apex of the wings milky-white.

Length 110—112 millim. Alar expanse 120—144 millim.

Hab. St. Domingo; Bahia, Para, Rio, San Paul, Brazil.

Legion II. AGRIONINA.

Two antecubital transverse nervules.

LESTES Leach.

The fourth apical sector broken; the postcostal space simple; the quadrangular space trapezoidal, with the exterior inferior angle

acute; the pterostigma large, oblong: appendages in the males forcipated.

1. L. grandis!

Lestes grandis Ramb.! Neuropt. 244, 1.

Brassy-green, mouth reddish-yellow; dorsum of the thorax orange, each side with a brassy-green stripe; sides yellow, superiorly with a broad brassy-green stripe, inferiorly with a fuscous one; feet yellowish, femora exteriorly, tibiæ interiorly and tarsi black; abdomen long, slender, brassy-green, a basal yellow lunule upon each side of the segments; superior appendages of the male long, semicircular, the apex a little thicker, incurved, an interior stout basal tooth, one obtuse one upon the middle, and an ante-apical oblique tubercle upon them; inferior appendages short, obtuse, the apex ciliated: valvules of the female yellow, exteriorly broadly black, the apex dentated; wings hyaline; pterostigma large, broader in the middle, fuscous; sixteen postcubital cross-nervules.

Length 59—50 millim. Alar expanse 72—66 millim. Pterostigma 3 millim.

Hab. Mexico (De Selys;) Columbia, Venezuela (Appun).

2. L. rectangularis!

Lestes rectangularis Say, Jour. Acad. Philad. VIII, 34, 1.

Brassy-fuscous, mouth yellow; dorsum of the thorax brassy-brown, a line upon the middle and each side with a broad stripe, narrowed in front yellow; sides pale yellow, superiorly a brassy-brown stripe and posteriorly with two linear black spots; feet yellow, femora exteriorly, tibiæ and tarsi interiorly black; abdomen long, very slender, yellow, the dorsum fuscous, the apex of the segments black, and with an interrupted, yellow, basal lunule; the apical segments entirely blackish-fuscous; appendages black, the superior ones short, forcipated, the base interiorly dilated, armed with two teeth, the apical one larger, the apex narrow, incurved; inferior appendages long, rather slender, approximated, the apex acute, beneath curved; valvules of the female, with the margin entire; wings hyaline, the costa yellow; pterostigma short, the sides a little oblique, black; ten postcubital cross-nervules.

Length 53—41 millim. Alar expanse 49—41 millim. Pterostigma $1\frac{1}{4}$ millim.

Hab. Chicago (Osten Sacken); Indiana; Mass. (Say); Maryland; Pennsylvania; New Jersey (Uhler); New York (Calverly); Savannah, Georgia; Minnesota (Kennicott).

I have seen two females, very much like this (*L. habilis* mihi from Pennsylvania and Georgia); they have the tarsi yellow, and the margin of the valvules dentated. Is it a distinct species?

3. **L. alacer!**

Lestes alacer Hagen!

Black; mouth yellowish; dorsum of the thorax black, each side, exteriorly, with a yellowish-green stripe, sides livid, with a broad, fuscous, middle fascia; feet yellow, beneath and tarsi black; femora and tibiæ with an external black line; abdomen slender, black, sides yellow; appendages black, the superior ones forcipated, the base interiorly with a tooth, and upon the middle a rounded lamina; the inferior appendages a little shorter, straight, flat, distant, with the apex truncated; wings hyaline; pterostigma black, narrow, margined with yellow in front; nine postcubital cross-nervules. (Male.)

Length 39 millim. Alar expanse 42 millim. Pterostigma $1\frac{1}{2}$ millim.

Hab. Western Texas, Pecos River (Capt. Pope).

4. **L. stulta!**

Lestes stulta Hagen!

Black, mouth yellow; dorsum of the thorax black, a line upon the middle, and each side exteriorly a narrow stripe, yellow; sides yellow, with a superior, broad black stripe, which is triangularly dilated at the wings; feet yellow, femora exteriorly, tibiæ interiorly, and tarsi black; wings hyaline, costa somewhat yellow; pterostigma long, fuscous, margined on both sides with yellow; eleven postcubital cross-nervules. (The abdomen is wanting.)

Length —? millim. Alar expanse 52 millim. Pterostigma $1\frac{1}{2}$ millim.

Hab. California.

5. **L. congener!**

Lestes congener Hagen!

Black, mouth yellow; dorsum of the thorax black-brassy, a line upon the middle and a narrow stripe each side yellow; sides yel-

low, with a superior, broad black-brassy stripe, which is dilated at the wings; beneath yellow, margined with black; feet yellow, femora exteriorly and tibiæ interiorly black; abdomen slender, black-brassy, with a yellow lunule upon the base of the segments; superior appendages black, yellow at the base, forcipated, with a basal tooth interiorly, and a middle lamina, with the margin serrated; inferior appendages short, approximated, the apex obtuse, recurved; wings hyaline; pterostigma oblong, black; ten postcubital cross-nervules. (Male.)

Length 37 millim. Alar expanse 43 millim. Pterostigma $1\frac{1}{2}$ millim.

Hab. New York; Texas (Friedrich).

6. L. simplex!

Lestes simplex Hagen!

Black, mouth pale; thorax black, dorsum each side with a broad yellow stripe, which is cleft at the wings; sides and beneath black, pruinose; feet yellow, femora exteriorly, tibiæ interiorly, and tarsi black; abdomen slender, black, pruinose at the apex, a basal yellow lunule to the segments; appendages black, superior ones forcipated, with an internal basal tooth, the middle of the inner margin somewhat dilated, serrulated; inferior appendages short, approximated, the apex obtuse, curved underneath; wings hyaline; pterostigma oblong, black; twelve or thirteen postcubital cross-nervules. (Male.)

Length 40 millim. Alar expanse 43 millim. Pterostigma $1\frac{1}{3}$ millim.

Hab. Mexico (Deppe).

Similar to *L. congener*, but the thorax is narrower and the appendages are different.

7. L. forficula!

Lestes forficula Ramb.! Neuropt. 247, 5.

Black, mouth pallid; dorsum of the thorax pale blue, each side with a narrow, brassy-green stripe, margined with black; a middle blue line, also margined with black; sides and beneath black, pruinose; feet yellow, femora bilineated above with black, tibiæ black interiorly, the anterior ones exteriorly lineated with black, tarsi black; abdomen brassy black, with the apex pruinose, the middle segments at base and a lunule at apex, pallid; appendages black,

the superior ones forcipated, with a basal internal tooth and an obliquely truncated lamina upon the middle, with the apex serrated; the inferior ones long, narrow, straight, the apex rounded, somewhat broader; wings hyaline, the pterostigma short, oblong, black; eleven postcubital cross-nervules. (Male.)

Length 40 millim. Alar expanse 39 millim. Pterostigma $1\frac{1}{4}$ millim.

Hab. Mexico; Cuba (Gundlach); Brazil.

8. L. vidua!

Lestes vidua Hagen!

Brassy-black, mouth yellow; dorsum of the thorax black-brassy, a middle line and a narrow stripe each side, somewhat interrupted at the wings, and subexcised, of a yellow color; sides yellow, with a broad black stripe superiorly, which is broader at the wings, and two spots inferiorly, also black; beneath yellow, each side with a marginal black spot; feet yellow, femora and tibiæ exteriorly lineated with black, tarsi black; dorsum of the abdomen brassy-black, a basal yellow lunule upon the segments; sides yellow, venter black (appendages destroyed); wings hyaline, pterostigma large, oblong, fuscous, margined with yellow at the sides; ten postcubital cross-nervules.

Length 40? millim. Alar expanse 45 millim. Pterostigma $1\frac{1}{2}$ millim.

Hab. New Orleans (Pfeiffer); Vienna Museum.

It is similar to *L. congener* Hag.

9. L. tenuata.

Lestes tenuata Ramb. Neuropt. 245, 2. Selys, Poey Ins. Cuba, 463.

Obscure bluish-green; thorax obscure whitish, with four greenish-blue stripes, two of them dorsal; feet pale, femora trilineated with black, tibiæ beneath and tarsi black; dorsum of the abdomen bluish-green, the sides pale, a yellow basal lunule upon the segments; superior appendages forcipated, inside at the base with a rounded tooth, behind the middle they are denticulated, and exteriorly dentated, the apex somewhat rounded; the inferior ones short, obtuse, the apex rounded, pilose; wings hyaline, pterostigma black. (From the description of Rambur.)

Length 45 millim. Alar expanse 50 millim.

Hab. The island of Martinique. Similar to *L. forficula.*

10. L. eurina.

Lestes eurinus Say! Journ. Acad. Philad. VIII, 36, 3.

Blue, varied with green and violet; mouth yellow; dorsum of the thorax each side with a yellow stripe, which is cleft and dilated at the wings, the sides yellow; abdomen blue, the segments green at apex; venter black; superior appendages forcipated, beneath bidentated, the inferior appendages short, conical; feet black, the femora beneath and tibiæ exteriorly pallid; wings hyaline, pterostigma black. (From the description of Say.)

Length 47 millim.

Hab. Massachusetts (Harris).

11. L. unguiculata!

Lestes unguiculata Hagen!

Green-brassy; mouth yellow; dorsum of the thorax brassy-brown, a line upon the middle and a narrow stripe each side, yellow; sides yellow pruinose, with a broad, superior brassy-brown stripe, and inferiorly with a black, broad vitta; beneath yellow; feet yellow, femora bilineated with black, tibiæ inside, and tarsi black; dorsum of the abdomen green, the apex brown-brassy, a yellow lunule upon the base of the segments, base and apex of the tergum pruinose, the sides yellow, venter black; superior appendages black, yellow at base, forcipated, with a basal internal tooth, and a middle excised lamina, which is dentated upon the margin; the inferior appendages long, narrow, cruciate, incurved at the apex; wings hyaline, pterostigma oblong, fuscous, the sides margined with yellow; nine or ten postcubital cross-nervules.

In the female, the inferior fascia of the thorax is wanting.

Length 40—30 millim. Alar expanse 43—37 millim. Pterostigma $1\frac{1}{4}$ millim.

Hab. Chicago (Osten Sacken); Bergen Hill, New Jersey (Guex); New York; St. Louis (Engelmann); Wisconsin (Robt. Kennicott).

12. L. hamata!

Lestes hamata Hagen!

Brownish-brassy; mouth yellow; dorsum of the thorax brown-brassy, with a middle line, and each side a broad stripe, narrowed at the wings, yellow; sides yellow, pruinose, with a superior, broad,

brown-brassy stripe, and a black spot upon the pectus, beneath yellow; feet yellow, femora exteriorly, tibiæ interiorly and tarsi black; abdomen obscure green-brassy, with a basal yellow lunule to the segments; appendages black, the superior ones forcipated, with a basal, internal tooth, and a lamina with the margin straight and its apex dentated; the inferior appendages long, straight, narrow, flat, the apex rounded; wings hyaline, pterostigma oblong, black, the sides margined with yellow; eleven postcubital cross-nervules.

Length 42—38 millim. Alar expanse 45—43 millim. Pterostigma 1½ millim.

Hab. Bergen Hill, New Jersey (Guex); Florida (Osten Sacken); Chicago (*id.*); Wisconsin (Robt. Kennicott); North Red River (*id.*).

13. L. forcipata!

Lestes forcipata Ramb. Neuropt. 246, 4.

Brassy-green; mouth yellow; dorsum of the thorax green-brassy (♂) or with a middle line and a stripe each side, yellow ♀; sides yellow, with a superior, green-brassy stripe, dilated at the wings, or with an inferior black stripe (♂); feet yellow, femora bilineated with black, tibiæ interiorly and tarsi black; abdomen brassy-green, sides yellow, or at the base and apex pruinose (♂); a basal lunule upon the segments yellow; appendages black, the superior ones forcipated, on the inside bidentated, the intermediate lamina with its margin rather straight, serrated; the inferior appendages long, flat, the apex dilated interiorly, somewhat spoon-shaped; wings hyaline; pterostigma black, margined with yellow at the sides; twelve postcubital cross-nervules.

Length 35 millim. Alar expanse 40 millim. Pterostigma 1½ millim.

Hab. Chicago; Washington (Osten Sacken); Wisconsin (Robt. Kennicott). Extremely like *L. nympha*, of Europe, it seems hardly different from that species. Is this the true *L. forcipata* of Rambur?

PARAPHLEBIA Selys.

Postcostal space furnished with two or three areoles; sectors numerous.

1. P. zoe!

Paraphlebia zoe Selys! Monog. Agrion.

Apex of the wings black.

Hab. Mexico (Collection of De Selys Longchamps).

PALAEMNEMA Selys.

The quadrangular space oblong; the second sector of the triangle almost wanting.

1. P. paulina!

Agrion paulina Drury, II; tab. xlvi, fig. 4.—*Euphaea paulina* Ramb. Neuropt. 231, 5. Oliv. Enc. Method. VII, 572, No. 18.

Reddish-blackish; thorax thick; wings hyaline, fuscous at the apex, at the base having the second and third humeral spaces yellowish-rufescent; pterostigma long, narrow. (Rambur.)

Hab. Honduras. (Collection of De Selys Longchamps.)

TRICHOCNEMIS Selys.

Quadrangular space sub-oblong; pterostigma rhomboidal (cf. Poey, Ins. Cuba, 464.)

1. T. tibialis.

Platycnemis tibialis Ramb. Neuropt. 241, 3.

Azure-blue; thorax in front with three stripes, and a lateral line black-greenish; abdomen above greenish-black, a dorsal interrupted line, the posterior margin of the segments, the last segment and the sides yellowish or blue(?); feet armed with long cilia, yellowish, the anterior femora black, the base interiorly yellow, the anterior tibiæ exteriorly black; the posterior femora black exteriorly, lineated with yellow, tarsi black; wings hyaline; pterostigma rufous. (♀. From the description of Rambur.)

Hab. North America. (Collection of De Selys Longchamps.)

2. T. minuta.

Trichocnemis minuta Selys, Poey Ins. Cuba, 464.

Brassy-brown; mouth, front, a transverse occipital stripe, an antehumeral stripe, the sides of the thorax and the base and sides of the segments of the abdomen, pale reddish; wings hyaline;

pterostigma rhomboidal, fuscous, the interior part obscurer. (From the description of De Selys.)

Length near 27 millim. Alar expanse 32 millim.

Hab. Calisco, Cuba (De Selys).

PROTONEURA Selys.

Quadrangular space oblong; no second sector of the triangle (cf. Poey, Ins. Cuba, p. 470).

1. P. capillaris.

Agrion capillare Ramb. Neuropt. 280, 30.—*Protoneura capillaris* Selys, Poey Ins. Cuba, 471.

Extremely slender; thorax steel-blue, above blackish-violet; abdomen hair-like, violet-black, the third segment extremely long, marked with a large, pale greenish-blue spot; wings long, extremely narrow, hyaline; the pterostigma black, subquadrate. (♂. From the description of De Selys.)

Length near 20 millim. Alar expanse 35 millim.

Hab. Cuba. (Collection of De Selys Longchamps.)

2. P. antennata.

Agrion antennata Say, Journ. Acad. Philad. VIII, 39, 3.

♂. Obscure bluish-green, somewhat metallic; head green before, mouth yellow, vertex and occiput black, the latter with a glaucous band which is clavate at each end; eyes dark greenish, above blackish; antennæ with the two basal joints thicker than the others, equal in length, the second one cylindrical, the third attenuated at base; dorsum of the thorax with a glaucous stripe each side; feet pale, with a broad black line on the femora and one on the tibiæ, excepting the posterior ones; abdomen with a blue band at the base of the segments, the sides green, venter glaucous, with a black line; wings hyaline; pterostigma rhomboidal. (From Say's description.)

Length near 33 millim.

Hab. Indiana.

A species not seen by me. Say says: "Two basal joints of the antennæ subequal," but from the description and from analogy, I conclude that, not the first and second segments, but the second and third, are equal: the first segment is always very short in the *Agrions*.

The length of the second segment in *Agrion antennata* Say, shows that it does not belong to the genus *Agrion* in its stricter sense. I am not quite sure if it is a *Protoneura*.

AGRION Fab.

The *apical sector* straight; the *postcostal space* simple; the *quadrangular space* trapezoidal, with the exterior, inferior angle acute; the pterostigma small, rhomboidal; abdominal appendages of the males short.

(Nehalennia Selys.)

The abdomen long and very slender; the colors brazen.

1. A. irene!

Agrion irene Hagen!

Bright brassy-green; head yellow in front; the third article of the antennæ annulated with pale; the hind margin of the prothorax broad triangular ♂, or biemarginated ♀; dorsum of the thorax bright brassy-green, the sides yellowish, above brassy-green; feet pale, exteriorly lineated with black; the abdomen slender, brassy-green, the sides and a basal yellow lunule upon the 3—6 segments; segment 8 with an apical spot, 9 with a triangular dorsal one, 10 almost altogether blue ♂, or 9 blue at the sides, and 10 blue at the apex ♀, the tenth segment has the margin excised, dentated; appendages extremely short, the superior ones two-parted, obtuse, the interior branch longer; the inferior appendages are longer, blue, triangularly tuberculated; ♀ apex of the 10th segment cleft; with the appendages obtuse, short, yellow; the eighth segment with no ventral spine; wings hyaline; pterostigma short, rhomboidal, luteous; from nine to eleven postcubital cross-nervules.

Length 25—28 millim. Alar expanse 28—30 millim.

Hab. Chicago and Florida (Osten Sacken); Wisconsin and Illinois (Robt. Kennicott); New Jersey (Uhler); Maine (Packard). A most beautiful species.

2. A. macrogaster.

Agrion macrogaster Selys, Poey Ins. Cuba, 465.

Brassy-brown; dorsum of the prothorax testaceous, the hind

lobe black, emarginated upon the middle; dorsum of the thorax, brown-brassy, each side with a testaceous stripe, sides and beneath pale; feet pale, femora exteriorly black; abdomen extremely slender, brassy-brown, with the incisures pale; wings hyaline, pterostigma rhomboidal, fuscous, interiorly obscurer. (♂. From the description of De Selys.)

Length near 46 millim. Alar expanse 43 millim.

Hab. Jamaica (De Selys Longchamps).

(**Ischnura** Charp.)

3. A. iners!

Agrion iners Hagen!

Brassy-black, varied with green and blue; head black, occiput each side with a green point ♂, or a bluish one ♀; prothorax with the posterior lobe short, broader in the middle, rounded, hardly elevated; dorsum of the thorax brassy-brown, each side with a narrow green stripe; sides green, a line beneath black; feet black; femora and tibiæ interiorly and the tarsi in part green; abdomen brassy-black, the first articulations steel blue, 3—5 with a medially interrupted yellow ring upon the base of each, 8 entirely blue, 9—10 sides blue ♂ and ♀; appendages short, the superior ones obtuse, with a process interiorly, beneath; the inferior appendages a little longer, cylindrical, subarcuated; the posterior margin of the last segment elevated in the middle, sub-bifid; the female has an acute ventral spine upon the 8th segment; wings hyaline, pterostigma rhomboidal, luteous, the anterior ones of the male black, with the apex whitish; eight postcubital cross-nervules.

♀. Var. *aurantiaca.* Head green in front, with bluish occipital points; dorsum of the thorax orange, a broad brassy-brown stripe upon the middle, the sides dirty green; abdomen brassy-black, the sides dirty green; the first segment orange, the second orange, with a brassy-black apical spot; the third to the fifth with a basal yellow ring which is interrupted in the middle; the following segments are brassy-black; feet pale, with an external fuscous line.

Length 31—34 millims. Alar expanse 31—40 millim.

Hab. New York; Maryland (Uhler); Washington (Osten Sacken); Louisiana (Schaum); Mexico (Deppe); Tampico (Saussure); Cuba (Osten Sacken).

The colors of the living insect were made known to me by Baron Osten Sacken.

4. A. tuberculatum.

Agrion tuberculatum Selys, Poey Ins. Cuba, 467.

Black-brassy; a round blue point upon each side of the occiput; posterior lobe of the prothorax produced in the middle; thorax yellowish-green, in front black-brassy, with two blue stripes; eighth segment of the abdomen blue, the tenth, in the males, tuberculated behind; wings hyaline, pterostigma rhomboidal, fuscous; pterostigma of the male black within. (From the description of De Selys Longchamps.)

Length 35 millim. Alar expanse 37 millim.

Hab. Cuba; Campeachy; Cayenne.

5. A. ramburii!

Agrion ramburii Selys, Poey Ins. Cuba, 468.

Brassy-brown, varied with green and blue; head each side with a green occipital point; prothorax with the posterior lobe small, having a flat tubercle upon the middle, in the female broader; dorsum of the thorax brassy-brown, each side with a narrow green vitta; the sides green, with a medial black stripe at the wings; feet pale exteriorly, lineated with black; abdomen brassy-fuscous, the sides green, segments 3—6 with a yellow, medially interrupted, basal band, segments 8—9 blue, with a black stripe each side; appendages short, superior ones thick, triangular, excavated on the inside; inferior ones acute, unguiculated; the last abdominal segment with the posterior margin elevated in the middle and bifid; wings hyaline, pterostigma small, rhomboidal, in the anterior wings of the male black.

♀ Either thorax reddish-yellow, the dorsum of the thorax with a broad brassy stripe, the whole of the abdominal dorsum brassy-fuscous; or pruinose, black, with the apex of the abdominal segments also black.

Length 25—28 millim. Alar expanse 27—30 millim.

Hab. New York; Washington; Dalton, Georgia (Osten Sacken); Philadelphia; Bergen Hill, New Jersey (Guex.); St. Louis. I have not seen the specimens of De Selys; he notes them to be from Martinique; Campeachy; Yucatan and Vera Cruz; are they different? I formerly called my species *Agrion expertum!*

6. A. positum!

Agrion positum Hagen!

Brassy-fuscous, varied with green; head brassy-fuscous, each side with an occipital point green (♂), or blue (♀); prothorax with the posterior lobe small, rounded and produced in the middle, dorsum of the thorax brassy-brown, each side anteriorly with a stripe and at the wings a point (forming an ! sign) green, sides yellowish-green, with a black line upon the middle; feet yellowish, the femora, and the tibiæ exteriorly black; abdomen brassy-fuscous, sides yellowish-green, the brassy-fuscous color is dilated before the apex of the segments; the incisures black, the first green; segments 3—7 with a basal yellow lunule; the dorsum of the last segment has, sometimes, a blue pruinose, quadrangular spot, the posterior margin of this segment is elevated in the middle, and bifid; appendages short, yellow, the superior ones tuberculose inflated, a small tooth, exteriorly, upon the middle, the inferior ones flat, recurved, with the apex black, serrated; the tenth segment in the female, with the hind margin yellow, entire; no ventral spine; the appendages short, trigonal, approximated, yellow; wings hyaline, pterostigma small, rhomboidal, fuscous, surrounded with pale. 7—9 postcubital cross-nervules.

Length 24—28 millim. Alar expanse 23—34 millim.

Hab. Savannah, Dalton, Georgia; Washington (Osten Sacken).

The colors of the living insect were made known to me by Baron Osten Sacken. The male (from Dalton) is sometimes smaller, having 5 postcubital cross-nervules; but it can hardly be a distinct species. The adult female is black, pruinose, with the apex of the segments black-brassy.

7. A. hastatum!

Agrion hastata Say, Journ. Acad. Philad. VIII, 38, 2. Selys! Poey Ins. Cuba, 470 (subg. Anomalagrion). *Agrion anomalum* Ramb.! Neurop. 281, 31. *Agrion venerinotatum* Haldeman, Proc. Acad. Philad. 1844, 55.

Brassy-green, varied with orange and yellow; head brassy-green in front, and an occipital point each side orange; prothorax with the posterior lobe somewhat produced in the middle; dorsum of the thorax brassy-green, each side with a narrow yellow stripe, sides yellow, superiorly brassy-green, inferiorly a black stripe at the wings; feet yellow, apex of the femora with a black stripe

exteriorly: abdomen yellow, segments 1—2 dorsum brassy-green, 3 and 6 with a very narrow dorsal spot before the apex, 4 and 5 with a basal acute spot and an apical orbicular one, 7 the dorsum entirely, and the eighth with a quadrangular basal spot brassy-green. (The markings in the younger individuals are very variable; the second segment has the dorsal spot incised each side before the apex, 3 with the dorsal spot interrupted, 7 with the basal spot bifid, 8 and the following ones entirely yellow; sometimes 3—6 have a basal stripe, and the apical spot almost obsolete, and 7—10 yellow.) The tenth segment has a long process upon the middle, which is oblique, cylindrical and bifid at the apex; appendages short, yellow, superior ones broader, incurved, broadly bifid, inferior ones a little longer, unguiculated; wings hyaline, pterostigma of the posterior ones rhomboidal black, of the anterior ones very singular, larger, rufous, surrounded with yellow, and not attaining to the costal margin; seven postcubital cross-nervules.

♀ Head orange, having a broad brassy-green, transverse stripe; posterior lobe of the prothorax produced in the middle; dorsum of the thorax orange, with a broad brassy-green stripe; sometimes a black humeral line; sides yellowish; feet pale yellow; abdomen orange, segment 6, a dorsal line dilated at the apex, 7—9 dorsum brassy-fuscous, 9 having a yellow middle fascia; posterior margin of 10 entire; ventral spine of 8 almost absent; appendages short, trigonal, thick, yellow; wings hyaline, pterostigma of each of the wings regular, yellowish.

Var. ♀. Brassy-black, pruinose, thorax and abdomen with the sides yellow; the feet exteriorly lineated with black.

Length 23—27 millim. Alar expanse 23—30 millim.

Hab. Indiana (Say); Maine (Packard); Mass. (Scudder); Maryland (Uhler); Bergen Hill, New Jersey (Guex.); Savannah, Georgia (Osten Sacken); Louisiana (Schaum); Florida (Osten Sacken, Norton); Pennsylvania (Haldeman); Cuba; Merida; Venezuela. A common species.

The form of the pterostigma in the anterior wings of the male is very singular; no other species of Odonata have the pterostigma so separated from the costal margin.

8. A. capreolus!

Agrion capreolus Hagen!

Brassy-black, head in front, and an occipital point each side

green; posterior margin of the prothorax, with the middle lobe small, rounded; dorsum of the thorax black, each side of it a green stripe; sides green, with a small black stripe at the wings; feet pale, exteriorly, in part, lineated with black; abdomen very slender, brassy-black, the sides and a basal annulus upon segments 3—6 yellowish-green; apical half of 8, and 9 entirely blue; a stout process upon the margin of the tenth segment, which is two-horned; appendages short, superior ones black, trigonal, obtuse; inferior ones yellowish, longer, two-parted, the external branch broader, trigonal, the internal branch longer, cylindrical, unguiculated, strongly recurved; wings hyaline; pterostigma small, yellow, in the middle fuscous. Six to eight postcubital cross-nervules. Male.

Length 22 millims. Alar expanse 21 millim.

Hab. Porto Rico, Brazil.

Almost the smallest species known.

9. A. aduncum!

Agrion aduncum Hagen!

Black, varied with yellow; head black, in front and an occipital spot which is cuneiform, each side, yellow; posterior margin of the prothorax rounded; dorsum of the thorax luteous, with a broad medial, black stripe; sides luteous; feet luteous, exteriorly lineated with black; abdomen very slender, brassy-black, the sides, and a basal ring, which is excised in the middle, yellow, upon segments 3—8; 9—10 blue (♂), or 9 at the sides and 10 entirely luteous (♀); appendages very short, the superior ones longer, biparted, the external branch cylindrical, obtuse, straight; the internal branch slender, curved downwards; the inferior appendages obtuse, emarginated at the apex; ♀ apex of the tenth segment cleft; the appendages obtuse, luteous; eighth segment with an acute ventral spine; wings hyaline; pterostigma small, rhomboidal, luteous, fuscous in the middle. Nine postcubital cross-nervules.

Length 26 millim. Alar expanse 26 millim.

Hab. Cuba.

10. A. discolor.

Agrion discolor Burm.! Handb. II, 819, 8.

Uniformly testaceous, or with the dorsum rosy, or brassy-black; thorax two-striped; pterostigma pale. Female. (From Burmeister's description.)

Length 26 millim.

Hab. South Carolina (Zimmerman); unknown to me; is it not a female *Agrion saucium* Burm. ?

A. dorsale Selys, Poey Ins. Cuba is perhaps different.

11. A. credulum!

Agrion credulum Hagen!

Brassy fuscous; head in front and an occipital point each side blue; posterior lobe of the prothorax short, rounded; dorsum of the thorax brassy fuscous, each side with a blue stripe, sides blue, a line in the middle black; feet black, femora within, base of the tibiæ exteriorly, and apex of the tarsi pale; abdomen brassy fuscous, the sides and a basal ring upon segments 3—6 yellow; segment 8 entirely, 9 base only blue; segment 10 elevated in the middle of the margin, sub-bifid; appendages short, apex of the superior ones arcuated, biparted; the internal branch longer, at the apex obliquely truncated, the external branch conical; the inferior appendages a little longer, unguiculated; wings hyaline, pterostigma of the anterior ones black, exteriorly whitish, of the posterior wings luteous. Eight postcubital cross-nervules. Female similarly colored, pterostigma of all the wings luteous. (The specimen is very much mutilated.)

Var. ♀. Head brassy-green, in front and an occipital point each side orange, posterior lobe of the prothorax short, rounded; thorax orange, dorsum with a middle brassy-green stripe; feet yellowish, exteriorly black; abdomen brassy-green, sides, a ring upon the basal segments and the second segment each side at base orange yellow. (The apex of the abdomen is destroyed.)

Length 30 millim. Alar expanse 29 millim.

Hab. Cuba (Poey); St. Thomas. Allied to *Agrion ramburii.*

12. A. defixum!

Agrion defixum Hagen!

Black; head in front and an occipital point each side green; posterior margin of the prothorax short, rounded; dorsum of the thorax black, each side with a green stripe; sides green, a small stripe at the wings black; feet green, exteriorly black; abdomen black, sides, and a basal annulus upon segments 3—6 green, 8—9 blue, at base a little black; 10 with the margin elevated in the middle, sub-bifid; appendages short, superior ones two-branched,

external branch conical, straight, internal branch longer, flat; inferior ones unguiculated, longer, oblique, recurved; wings hyaline; pterostigma of the anterior ones black, exteriorly white; of the posterior wings luteous; seven postcubital cross-nervules.

Length 30 millim. Alar expanse 30 millim.

Hab. Northern California.

13. A. denticolle!

Agrion denticolle Burm. Handb. II, 819, 9.

Black; head anteriorly, and an occipital point each side, blue; margin of the prothorax straight, the middle lobe small, narrow, rounded; dorsum of the thorax brassy-black (♂), or each side with a blue stripe (♀); sides blue, or with an anterior, superior black spot (♀); feet pale, femora and tibiæ partly black, or lineated with black (♀); abdomen (eight last segments of the male destroyed) brassy-black, the sides and a basal ring upon 3—6 yellowish, 8 blue, 9 with a large dorsal spot, and the base covered with blue; 10 dorsum medially elevated, plicated, yellow; appendages short, yellow; eighth segment with no ventral spine; wings hyaline; pterostigma luteous; anterior pterostigma of the male black; ten postcubital cross-nervules.

Length 27 millim. Alar expanse 30 millim.

Hab. Moretia, Mexico (Saussure).

14. A. demorsum!

Agrion demorsum Hagen!

Brassy-green; head in front, and an occipital point, blue; posterior margin of the prothorax small, rounded; dorsum of the thorax brassy-green, each side of it a blue stripe; sides blue; feet pale, exteriorly black; abdomen brassy-green, the sides and a basal annulus, on segments 3—6, yellowish, segments 8—9 blue; posterior margin of 10 with a narrow, elevated middle process, the apex bifid; appendages short, superior ones fuscous, two-branched, external branch conical, straight, the internal one longer, flat; inferior appendages yellow, broadly bifid, the branches spreading apart, unguiculated, the apex black; the upper branch longer; wings hyaline; pterostigma luteous, anterior ones of the ♂ black, exteriorly white; 8—9 postcubital cross-nervules. (The abdomen of the female is partly destroyed.)

Length 27 millim. Alar expanse 30 millim.
Hab. Moretia, Mexico (Saussure).

15. A. verticale.

Agrion verticale Say, Journ. Acad. Philad. VIII, 37, 1.

Obscure blue, somewhat pruinose; head green, each side with a blue occipital spot; thorax blue, dorsum with a middle brassy stripe, and the sides with a black line; feet deep green, femora exteriorly black, tibiæ with an exterior black line; abdomen brassy-green, the incisures pale, segments 9—10 blue; 10 with the posterior middle somewhat elevated, elevation excised (♂), or the segments pruinose, black at their apex, with pale incisures (♀); venter pale green, with a middle black line; wings hyaline, pterostigma rhomboidal, fuscous. (From the description of Say.)

Length 25 millim.
Hab. Indiana (Say). "Rare. August."
Unknown to me; perhaps it is *A. positum?*

16. A. exsulans!

Agrion exsulans Hagen!

Black; head blue in front (♂), or yellowish-green (♀); occiput each side with a cuneiform blue spot; hind margin of the prothorax short, rounded, with a small tubercle upon the middle, which is larger in the female; dorsum of the thorax black, each side with a blue stripe; sides blue, with a narrow black line upon the middle (♂); or green, with a black middle stripe divided by a yellow line; a humeral yellow stripe each side, margined with fuscous, and with the sides green (♀); feet pale, exteriorly lineated with black; abdomen brassy-black, the sides and a ring upon the base of segments 2—6 bright blue; segment 10 with the posterior margin elevated and subexcised; appendages black, superior ones rounded bifid, the inferior branch longer; inferior appendages unguiculated, slender, recurved; or (♀) dorsum of the abdomen fuscous, sides dirty green, and with the apex of the ninth and the whole of the tenth segment blue; the appendages short; the eighth segment having a long ventral spine; wings hyaline, pterostigma small, rhomboidal, black (♂), or luteous (♀); nine postcubital cross-nervules.

Length 33—36 millim. Alar expanse 40 millim.

Hab. Philadelphia; Berkeley Springs, Va. (Osten Sacken); Pecos River, Western Texas (Capt. Pope).

The colors in the living insect were communicated to me by Baron Osten Sacken.

17. A. prognatum!

Agrion prognatum Hagen!

Green-brassy, varied with green; head above green-brassy, the mouth and a point upon each side of the occiput bright green; posterior margin of the prothorax very short, with a small tubercle upon the middle; dorsum of the thorax green-brassy, each side with a bright green stripe; sides green, with two short green-brassy stripes at the wings; feet pale, knees exteriorly lineated with black; abdomen slender, green-brassy, the sides, and a basal lunule upon segments 3—6, green; segment 9 entirely, and 10 with the sides bluish-green; the tenth segment has an elevated process upon the middle of the posterior margin, which is long, cylindrical, black, the apex yellow; superior appendages bifid, the exterior branch long, narrow, laminated, incurved; the inferior branch hardly shorter, yellow, curved downwards; the inferior appendages yellow, unguiculated; wings hyaline, pterostigma large, rhomboidal, snow-white, interiorly brownish-black; eight postcubital cross-nervules (♂).

Length 35 millim. Alar expanse 36 millim.

Hab. Berkeley Springs, Va. (Osten Sacken).

The colors of the living insect were made known to me by Baron Osten Sacken.

18. A. pollutum!

Agrion pollutum Hagen!

Brassy-fuscous; head brassy-fuscous, in front and a cuneiform, occipital spot each side orange; hind margin of the prothorax rounded; dorsum of the thorax brassy-fuscous, each side with a broad orange stripe; sides yellowish, with a black line inferiorly; feet yellowish, knees sublineated with fuscous; abdomen long, slender, brassy-fuscous; sides yellow, lateral margin yellow; segments 2—6 with a basal yellow annulus; 9 entirely and 10 sides blue (♂), or the apex of 9 and the whole of 10 blue (♀); appendages, superior ones long, with the apex broader, dolabriform;

the inferior ones shorter, unguiculated; apex of the tenth segment in the ♀ cleft; the appendages short; eighth segment with the ventral spine long; wings hyaline, pterostigma rhomboidal, narrow, fuscous; ten postcubital cross-nervules.

Length 34 millim. Alar expanse 34—38 millim.

Hab. Florida (Osten Sacken; Norton).

19. A. signatum!

Agrion signatum Hagen!

Fuscous; head in front and a cuneiform occipital spot each side yellow; posterior margin of the prothorax rounded; dorsum of the thorax each side with a broad yellow stripe; sides yellow, with a middle black line; feet yellow; abdomen long, slender, fuscous, the sides, segments 3—7 with a basal annulus, 9 entirely and 10 at the sides, yellow; superior appendages long, straight, subdolabriform, the apex not broader, at the extremity of the apex subincurved, black; inferior appendages short, black, subincurved; wings hyaline, pterostigma rhomboidal, fuscous, ♂; ten postcubital cross-nervules.

Length 35 millim. Alar expanse 36 millim.

Hab. Georgia (Abbot); Louisiana (Schaum).

20. A. coecum!

Agrion coecum Hagen!

Black; head brassy-black, with a blue occipital spot each side; posterior margin of the prothorax each side sub-excised; dorsum of the thorax brassy-black, each side with a rosy-blue stripe; sides rosy-blue, with a black stripe inferiorly; feet yellowish, exteriorly black; abdomen shorter, slender, black, segments 1—3 rosy-blue, 2 with a forked line, and 3 with the sides and apex black, 8 and 9 blue; appendages black, superior ones long, the base beneath dolabriform, the apex cylindrical; the inferior ones short, approximated cylindrical, recurved; wings hyaline, pterostigma small, rhomboidal, black; female paler, abdomen brassy-fuscous, segments 3—7 with a yellow basal annulus, the sides, and eighth segment almost entirely blue, the ventral spine acute; 10—12 postcubital cross-nervules. Male.

Length 31 millim. Alar expense 36 millim.

Hab. St. Thomas; Cuba. (Osten Sacken, Poey.)

Subgenus **Pyrrhosoma** Charp.

21. A. saucium!

Agrion saucium Burm.! Handb. II, 819, 10.

Red; head above black ♂, or middle blackish-fuscous ♀; posterior lobe of the prothorax short, the middle sub-depressed; dorsum of the thorax black ♂, or red ♀, sides yellowish-red; feet pale yellow; abdomen red; the seventh segment has the sides at apex black, and the remaining segments are entirely black; ♀ apex of the seventh segment each side with a point, and 8 and 9 are entirely black; appendages short, red, the superior ones depressed, flat, narrow, subsinuated; inferior ones a little longer, unguiculated; the tenth segment has the middle of the posterior margin elevated, excised; appendages of the female short, red, trigonal; the eighth segment with a longer ventral spine; wings hyaline, pterostigma rhomboidal, fuscous; 11—8 postcubital cross-nervules.

Length 26—22 millim. Alar expanse 31—27 millim.

Hab. Washington, Trenton Falls (Osten Sacken); Maryland, Pennsylvania (Uhler); South Carolina (Zimmerman); Illinois (Kennicott); Maine (Packard); Mass. (Scudder).

22. A. salvum!

Agrion salvum Hagen!

Red; head above with a broad brassy-green stripe; the posterior lobe of the prothorax broader, rounded, each side sub-excised; dorsum of the thorax red, upon the middle a broad brassy-green stripe excised each side at the wings; sides yellowish-red, with a superior short stripe brassy-green upon the middle; feet yellowish; abdomen red, venter paler; margin of the tenth segment excised in the middle; appendages short, red; superior ones cylindrical, straight, acute with a tooth inferiorly before the apex; inferior ones a little longer, unguiculated, subrecurved; (♀ apex of the abdomen wanting;) wings hyaline, pterostigma rhomboidal, fuscous; 9—11 postcubital cross-nervules.

Length 28 millim. Alar expanse 31 millim.

Hab. Mexico (Deppe).

23. A. vulneratum!

Agrion vulneratum Hagen!

Brassy-green, varied with red; head brassy-green, in front red; posterior lobe of the prothorax larger, margined with yellow, the sides obliquely truncated; dorsum of the thorax obscure brassy-green, each side with a narrow sulphur-yellow humeral line; sides sulphur-yellow; superiorly, a broad, bifid, brassy-green stripe, and two lines, the second one interrupted, black; feet reddish-yellow, femora exteriorly lineated with black; abdomen long, red, apex of the dorsum infuscated, or (♀) blackish-fuscous; appendages short, red, superior ones broad, triangular, flat, incurved at the apex; inferior ones oblong, broad, the apex truncated; segment 10 with the margin excised in the middle; appendages of the female short, broad, yellow; eighth ventral segment with no spine; wings hyaline, pterostigma rhomboidal, fuscous. 11 postcubital cross-nervules.

Var. ♀ Dorsum of the abdomen fusco-aeneous, with a broadly interrupted yellow ring at the base of the segments.

Length 33 millim. Alar expanse 34 millim.

Hab. Porto Rico (Moritz); Cuba (Poey); Essequibo, Guiana.

24. A. dominicanum.

Agrion dominicanum Selys. Poey, Ins. Cuba, 466.

Red; vertex, occiput, and the thorax above fusco-aeneous, with four pale red stripes; the sides and beneath yellow; feet pale red; wings hyaline, rather broad, pterostigma sub-elongated, fuscous. (From the description of De Selys Longchamps.)

Length 31 millim. Alar expanse 34 millim.

Hab. Hayti.

25. A. rufulum!

Agrion rufulum Hagen!

Rufous; head in front and behind yellowish; hind margin of the prothorax rounded; dorsum of the thorax rufous, sides yellowish; feet yellow; abdomen rufous, the sides and venter yellowish (the apex destroyed); wings hyaline, veins red, pterostigma rhomboidal, sanguineous. ♂. 11 postcubital cross-nervules.

Length about 37 millim. Alar expanse 38 millim.

Hab. North California.

Subgenus **Agrion** Charp.

26. A. annexum!

Agrion annexum Hagen!

Black, brassy; head and thorax villous; head marked with blue-black (♂), or reddish-yellow (♀); occiput each side with a large spot, which is serrated posteriorly; hind lobe of the prothorax rounded, subexcised on each side; dorsum of the thorax black, brassy, each side with a broad blue stripe (♂), or reddish-yellow; sides blue, or reddish-yellow, with an abrupt black, middle line; feet black, femora interiorly, tibiæ exteriorly (♂) or base externally (♀) pale; abdomen (♂) blue, the first segment with a basal spot, segment 2 with an orbicular, pedunculated apical one, 3—5 with the apical half anteriorly hastated, 6—7 almost entirely, and 10 entirely black-brassy; 8 and 9 are blue, with a black point each side on the middle; margin of 10 excised in the middle; appendages short, black, superior ones cylindrical, obtuse, straight; the inferior ones a little longer, trigonal, subunguiculated; (♀) reddish-yellow; segment 1 with a basal spot, 2 with a dorsal stripe, dilated before the apex, the rest with the dorsum fusco-aeneous; 3—8 have each side a triangular, larger, reddish-yellow spot; the margin of the tenth segment cleft in the middle; ventral spine of segment 8 long, acute; appendages short, thick, black; wings hyaline, pterostigma rhomboidal, large, fuscous; fourteen postcubital cross-nervules.

Length 35—37 millim. Alar expanse 43—50 millim.

Hab. Sitka (Eschscholz; Berlin Museum).

Allied to *A. cyathigerum* Charp., of Europe.

27. A. durum!

Agrion durum Hagen!

Black-brassy, head and thorax villous; (♂) marked with blue, or (♀) with yellowish-red; allied to the preceding species, but may be distinguished from it by the occipital spots being narrow, cuneiform, not posteriorly serrated; the prothorax has the posterior lobe rounded, not subexcised; the dorsum of the thorax has a middle line, which is blue or reddish-yellow; the feet pale, femora exteriorly and the tibiæ interiorly black, tarsi pale; abdomen (♂), segments 3—6 nigro-aeneous at the apex, longly hastated; supe-

rior appendages broad, excavated within, with a pale tubercle beneath; the inferior ones pale, hardly longer, acute; or (♀) dorsal bands of the segments, fusco-aeneous, narrower, dilated before the apex; pterostigma obscure, that of the males black; fourteen postcubital cross-nervules.

Length 37—42 millim. Alar expanse 44—50 millim.

Hab. Maryland (Uhler); Louisiana (Schaum); Florida (Osten Sacken; Norton).

28. A. civile!

Agrion civile Hagen!

Black-brassy, varied with blue (♂), or green (♀); head and thorax villous; head in front blue, occiput each side with an elongated blue spot; posterior margin of the prothorax rounded, entire; dorsum of the thorax nigro-aeneous, each side with a broad blue stripe (♂), or green (♀); sides blue in both sexes; beneath pruinose; feet pale, femora and tibiæ with an imperfect, external black line; abdomen blue (♂), segment 1 with a small basal spot, 2 with an orbicular apical one, 3—5 with an acute apical band, brassy-black; 6—7 brassy-black, blue at base; 8—9 blue; 10 brassy-black, the margin broadly excised; superior appendages black, long, divaricated, bifid, with a pale oval tubercle set between; inferior appendages short, pale, unguiculated; or (♀) blue, a dorsal large, lanceolated spot, dilated before the apex of the segments and not attaining the base upon segments 4—7, nigro-aeneous; margin of the tenth segment cleft; appendages short, thick, lurid; ventral spine of the eighth segment acute; wings hyaline, pterostigma rhomboidal, exteriorly rounded, black (♂), or luteous (♀); eleven postcubital cross-nervules.

Length 32—35 millim. Alar expanse 37 millim.

Hab. New York; Maryland (Uhler); Washington (Osten Sacken); Texas (Friedrich); Pecos River; Matamoras, Mexico.

The colors of the living insect were made known to me by Baron Osten Sacken.

29. A. praevarum!

Agrion praevarum Hagen!

Black-brassy, varied with blue (♂), or green (♀); head and thorax villous; very closely allied to the preceding species; differs in having the posterior margin of the prothorax each side excised;

(♂) abdominal segment 2 has an orbicular spot, which is subacuminate in front, the sides sometimes have a line brassy-black, 3 has an apical spot, acuminated in front, 4—6 brassy-black, with the base blue; superior appendages bifid, no tubercle inserted between; the abdomen of the female is marked very much like that of *Agrion civile* (the apex is destroyed); dorsum of the thorax with a middle green line.

Length 32 millim. Alar expanse 40 millim.

Hab. Mexico (Deppe); female from Trajos del Oro (Saussure).

30. A. ebrium!

Agrion ebrium Hagen!

Black-brassy, varied with blue; head and thorax villous; very closely allied to *Ag. civile*, differs in having broader occipital spots, the femora and tibiæ exteriorly, and sometimes the whole of the tarsi black; the abdomen has segment 6, upon the apical half, marked with a hastate, black-brassy spot, the superior appendages are bifid, no introduced tubercle, the branches equal, parallel (in *A. civile* divaricated); inferior appendages straight, the apex less acuminated; eleven postcubital cross-nervules. Male.

Length 29—31 millim. Alar expanse 36—40 millim.

Hab. Chicago (Osten Sacken); North America (Zimmerman); New Orleans (Pfeiffer; the specimen is very much mutilated, doubtful).

31. A. doubledayi!

Agrion doubledayi Selys! Revue des Odonates, 209; Poey! Ins. Cuba, 469.

Black-brassy, varied with blue (♂), or yellowish-green? (♀); head brassy-black, in front blue, the occipital spots sublinear; posterior margin of the prothorax rounded; dorsum of the thorax brassy-black, each side of it is a broad blue stripe, sides blue, a medial linear spot at the wings; feet pale, femora and tibiæ exteriorly lineated with black; abdomen (♂) blue, segment 1 with a basal quadrangular spot, segment 2 with an orbicular apical one, 3—5 with an apical ring, 6 with a large hastiform spot, and 7 and 10 entirely brassy-black, 8—9 entirely blue; margin of the tenth segment excised, in the middle somewhat bituberculated; superior appendages black, broad, thick, the apex excised, with a pale tubercle adjacent; the inferior ones pale, acute, oblique; or (♀)

dorsum of the abdomen brassy-black, with basal yellowish lunules upon the segments; segment 8 with an acute ventral spine; wings hyaline, pterostigma rhomboidal, small, black, or (♀) fuscous; ten postcubital cross-nervules.

Length 31 millim. Alar expanse 34 millim.

Hab. Florida (Norton); St. John's Bluff, Florida (Doubleday).

32. A. bipunctulatum!

Agrion bipunctulatum Hagen!

Black-brassy, varied with blue; head black, in front blue, occipital spots absent; posterior lobe of the prothorax broader, each side rounded; dorsum of the thorax brassy-black, each side of it a blue stripe; sides blue, with a black middle line; feet pale, femora and tibiæ with an external line, and the tarsi entirely black; abdomen blue; segment 1 has a basal spot, 2 has an apical point each side, 3—6 at the apex, 7 almost entirely brassy-black, 8—10 blue; margin of the last segment subexcised, each side tuberculous, a bifid tubercle upon the middle inferiorly; appendages extremely short, black, superior ones cylindrical, inferior ones a little longer, broader, obtuse, with an apical tooth superiorly; wings hyaline; pterostigma small, rhomboidal, rufous; eleven postcubital cross-nervules.

Length 28 millim. Alar expanse 33 millim.

Hab. Georgia (Abbot).

33. A. violaceum!

Agrion violaceum Hagen!

Violaceous; head with a transverse black stripe superiorly; a large violaceous occipital spot each side; posterior margin of the prothorax rounded, subexcised in the middle; dorsum of the thorax violet, upon the middle a narrow black stripe; sides pale violet, a bifid stripe above at the wings and a line upon the middle, black; feet pale, femora exteriorly, tibiæ interiorly and the tarsi entirely black; abdomen (♂) violet, segments 2 to 6 with an apical spot each side, and 7 almost entirely black; margin of 10 broadly excised; appendages short, superior ones broad, obtuse, inferior ones larger, the apex sub-bifid; or (♀) yellowish-green, segments each side with an apical stripe and point, and 7 almost entirely black;

segment 8 with no ventral spine; wings hyaline, pterostigma rhomboidal fuscous; 11—15 postcubital cross-nervules.

Length 33—36 millim. Alar expanse 40—44 millim.

Hab. Maryland (Uhler); Berkeley Springs, Virginia; Washington (Osten Sacken); Pecos River, W. Texas (Capt. Pope); Massachusetts (Scudder); Connecticut (Norton); New York (Edwards); Illinois (Kennicott); New Jersey, Pennsylvania (Uhler).

34. A. fontium!

Agrion fontium Hagen!

Brassy-black; head black, mouth and an occipital spot each side blue; posterior margin of the prothorax short, sub-rect; dorsum of the thorax black, each side of it a broad blue stripe; sides pale-blue, a stripe superiorly and a line upon the middle black; feet black, femora interiorly and tibiæ exteriorly pale; abdomen slender black, segments 4—7 with an interrupted, pale basal ring, dorsum of 9—10 blue, 10 with a medial black fascia, the hind margin excised; appendages short, black, superior ones reniform, broken, compressed; inferior ones larger, broad, excised; wings hyaline; pterostigma rhomboidal black.

Fourteen postcubital cross-nervules.

Var. Rosaceous; dorsum of the thorax each side with a broad rosy stripe; sides with a rosy point on the superior stripe at the wings; (♀) abdominal segments at sides, a dorsal line upon the middle and a basal ring pale; no ventral spine.

Length 36 millim. Alar expanse 42 millim.

Hab. Berkeley Springs, Virginia (Osten Sacken); Georgia (Abbot); the variety from Florida (Osten Sacken).

35. A. apicale!

Agrion apicalis Say, Journ. Acad. Philad. VIII, 40, 4.

Blue; head with a transverse black stripe above; posterior margin of the prothorax subrotund; dorsum of the thorax blue, the sutures black; sides blue, against the prothorax, superiorly, a quadrangular black spot (♂); feet pale, femora exteriorly and tibiæ interiorly black; abdomen brassy fuscous, a narrow dorsal line, a basal annulus to the segments and their sides pale; dorsal surface of the three last segments blue (♂), or brassy fuscous (♀); appendages small, the superior ones transverse, with a middle and

internal tooth; inferior ones longer, broad, bifid; margin of the tenth segment excised, tuberculous; appendages of the female short, obtuse; margin of the tenth segment cleft; no ventral spine to the eighth segment; wings hyaline, pterostigma rhomboidal, fuscous; fourteen postcubital cross-nervules.

Length 36 millim. Alar expanse 43 millim.

Hab. United States, "very common" (Say); Washington; Berkeley Springs, Virginia (Osten Sacken).

36. A. funebre!

Agrion funebre Hagen!

Violaceous; head with an arcuated fascia above, and a transverse occipital streak black; margin of the prothorax behind, upon the middle and each side subtruncated; dorsum of the thorax violaceous, a black stripe upon the middle, sides pale violaceous, a stripe superiorly, either divided or excised, and a line upon the middle black; feet pale, femora exteriorly, tibiæ interiorly and tarsi black; abdomen obscure violaceous, segment 2 each side with an angulose line, 3 to 6 apex or a spot each side, or entirely and 7 entirely black, 8 fuscous at base (?), the following ones violaceous; appendages short, superior ones obtuse, rounded at the apex and incurved; inferior ones longer, oblong, the apex bifid, the superior branch incurved; wings hyaline, pterostigma rhomboidal, fuscous. ♂. Fourteen postcubital cross-nervules.

Length 40 millim. Alar expanse 51 millim.

Hab. Mexico (Deppe).

It is allied to the two preceding species.

37. A. extraneum!

Agrion extraneum Hagen!

Very similar to the preceding, differs by having the head black above; the posterior margin of the prothorax rounded; dorsum of the abdomen black; margin of the tenth segment excised, beneath bituberculated; superior appendages broader, emarginated, the apex not incurved; the inferior ones bifid, the superior branch very much recurved, obliquely truncated. ♂.

Length 35 millim. Alar expanse 42 millim.

Hab. Tampico, Mexico (Saussure).

38. A. calidum!

Agrion calidum Hagen!

Very much like the preceding, differs in having the dorsum of the thorax black, each side a broad violaceous stripe; sides pale, a broad stripe above, and an abrupt line upon the middle black; feet almost entirely black; abdomen black, segments 9—10 blue above, margin of segment 10 less excised; superior appendages reniform, the internal tooth longer; inferior ones oblong, broad, the apex excised; wings hyaline sub-infumated, pterostigma larger, black. Fifteen postcubital cross-nervules.

♀ Head luteous (?), a stripe superiorly and a post-occipital streak black; margin of the prothorax behind sub-excised in the middle and each side, the thoracic process on each side laminated, oblong, curved exteriorly; dorsum of the thorax luteous (?), with a black stripe in the middle, sides luteous, with a black humeral line, dilated anteriorly; feet pale, the femora exteriorly, the tibiæ interiorly and the tarsi black; abdomen luteous (?), segment 2 each side, with an ante-apical spot, and 3—7 upon the apex black; dorsum of 10 almost entirely cleft; appendages short, luteous; no ventral spine; wings sub-infumated, pterostigma large, rufous.

Length 37—40 millim. Alar expanse 46—50 millim.

Hab. Tampico, Mexico (Saussure); California.

I saw a male taken at the same place (Tampico), allied to this species, but the epistoma was brassy-green, the sides of the thorax had no middle black line; the appendages destroyed. Is it a distinct species? The male from California is without head and appendages, and is, as yet, doubtful.

39. A. immundum!

Agrion immundum Hagen!

Most like *A. apicale*, but differs in the color, being luteous, perhaps rosaceous; dorsum of the thorax with a middle black stripe; a humeral black line, which is cleft at the wings; abdomen obscure luteous, segment 2 with a spot each side before the apex, the apex of 3—6, and 7 entirely black, the following ones blue (♂) or luteous; segments 2—7 each side with a black streak, the following ones blue (♀); superior appendages obtuse, excised at the apex; the inferior ones broad, sub-bifid at the apex, the supe-

rior branch conical, recurved; tenth segment of the female almost entirely cleft; the appendages short, luteous; no ventral spine; wings hyaline, pterostigma rhomboidal, fuscous; fourteen postcubital cross nervules.

Length 36 millim. Alar expanse 44 millim.

Hab. Tampico, Mexico (Saussure).

40. A. sedulum!

Agrion sedulum Hagen!

Black; head blue above; posterior margin of the prothorax sub-rect; dorsum of the thorax black, each side a blue stripe; sides blue, superiorly with a black fascia, which is biserrated below, and a black line upon the middle; feet pale, femora exteriorly and the tibiæ within black; abdomen black, segments 2 to 7 with a dorsal blue spot at base, the following ones entirely blue; appendages black, short, superior ones cylindrical, straight, obtuse, with an ante-apical tooth beneath; inferior ones longer, bifid, the branches divaricated, recurved beneath; margin of the tenth segment elevated in the middle, excised; wings hyaline, pterostigma rhomboidal, brownish-black. ♂. Thirteen postcubital cross-nervules.

Length 34 millim. Alar expanse 38 millim.

Hab. Berkeley Springs, Virginia (Osten Sacken); Pecos River, Western Texas (Capt. Pope).

The colors of the living insect were communicated to me by Baron Osten Sacken.

41. A. moestum!

Agrion moestum Hagen!

Fuscous; head blue in front; posterior margin of the prothorax subrect; dorsum of the thorax fuscous, each side with a broad blue stripe(?); sides brassy-fuscous, with an obscure blue middle stripe(?); feet luteous, femora exteriorly and tibiæ interiorly brassy-fuscous; abdomen brassy-fuscous, segments 3—7 with a basal blue lunule; segment 10 margin excised in the middle; appendages extremely short, the superior ones obtuse, incurved at the apex, the inferior ones broad, truncated at the apex, hardly sinuated.

♀ Pale green; head with a post-occipital fuscous streak; posterior margin of the prothorax subrect, each side with a brassy-

fuscous point; the process upon the thorax, near each side, laminated, oblong, short, rounded; thorax pale green, a dorsal, fuscous, middle line; feet pale green, the femora sublineated with fuscous; abdomen pale green, segments 3—7 each side, with a lateral fuscous streak; appendages short, pale; the wings hyaline, pterostigma rhomboidal, black (♂), or luteous (♀). Fifteen postcubital cross-nervules.

Length 43—45 millim. Alar expanse 50—56 millim.

Hab. Pecos River, Western Texas, July (Capt. Pope).

42. A. lugens!

Agrion lugens Hagen!

Luteous; head above with an arcuated, angulose line, and a postoccipital fascia blackish-brown; posterior margin of the prothorax subrotund, each side with an arcuated black spot; process of the thorax near each side, laminated, small, narrow, curved outwards; thorax luteous, a dorsal middle streak and two narrow stripes each side, fuscous; sides luteous, above with a broadly divided stripe, upon the middle at the wings an abrupt streak, and a line beneath black; feet luteous, femora exteriorly and tibæ interiorly subfuscous; abdomen thick, luteous, a broad stripe each side, confluent together at the apices of the segments, blackish-brown, the last segment cleft; appendages short, luteous; wings hyaline, pterostigma larger, rhomboidal, fuscous, luteous in the middle; sixteen postcubital cross-nervules. (♀.)

Length 50 millim. Alar expanse 67 millim.

Hab. Mexico (Mühlenpford; Berlin Museum).

It belongs to the genus Hyponeura Selys, which is distinguished by the postcostal space being *multi-areolate.*

43. A. lacrimans!

Agrion lacrimans Hagen!

Luteous; head luteous, above with spots in the middle, and a postoccipital streak black; posterior margin of the prothorax short, broadly bi-emarginated, and with a geminate black spot; laminated process near each side of the thorax broadened at the apex and curved inwards; dorsum of the thorax luteous, a black stripe on the middle; sides luteous, a humeral line dilated anteriorly, and a middle line black; feet luteous, exteriorly and tarsi brownish-black; abdomen luteous, a broad, black stripe each side,

confluent together at the apices of the segments (apex destroyed); wings hyaline, pterostigma rhomboidal, luteo-fuscous; sixteen postcubital cross-nervules. (♀.)

Length about 45 millim. Alar expanse 56 millim.

Hab. Cordova, Mexico (Saussure).

44. A. putridum!

Agrion putridum Hagen!

Fuscous; head fuscous, in front luteous; posterior margin of the prothorax subrect; dorsum of the thorax luteous, a fuscous stripe upon the middle; sides luteous; a stripe superiorly, which is excised at the wings, and a line upon the middle blackish-brown; feet luteous, femora exteriorly and tibiæ interiorly fuscous; abdomen black, segments 3—7 each side with a pale basal lunule; head, thorax, and apex of the abdomen pruinose; margin of the tenth segment excised in the middle; appendages short, superior ones obtuse, an ante-apical tooth beneath, the inferior appendages broad, truncated at the apex. ♀ pale green; head with a postoccipital black streak; posterior margin of the prothorax straight, each side with a black spot; laminated process near each side of the thorax small, straight, rounded; dorsum of the thorax green, a black line upon the middle; sides green, a black line in the middle; feet paler; abdomen green, each side with an interrupted black line; apex of the tenth segment excised; appendages short; wings hyaline, pterostigma rhomboidal, black (♂), or luteous (♀); fourteen postcubital cross-nervules.

Length 40 millim. Alar expanse 48 millim.

Hab. Wisconsin River (Kennicott); Berkeley Springs, Virginia (Osten Sacken); Maryland (Uhler).

45. A. cupreum!

Agrion cupreum Hagen!

Coppery-purple; head cupreous; posterior margin of the prothorax rounded; dorsum of the thorax cupreous, the middle carina black; sides pale, above coppery; feet black, tibiæ pale exteriorly; abdomen black, segment 2 fusco-aeneous, 4—8 with a basal blue annulus, 9—10 entirely blue; margin of 10 excised, bituberculated beneath; appendages black, the superior ones flat, subelongated, triangular, bifid at the apex, the interior branch subincurved; the inferior ones longer, the apex broader, excised. The eighth seg-

ment is sometimes all blue ♂. Specimens from Venezuela are smaller, but hardly distinct; their females have the head marked each side with a luteous, occipital point; hind margin of the prothorax slightly sinuated; laminated process near each side of the thorax short, curved inwards; dorsum of the thorax luteous, a cupreous stripe upon the middle; sides yellowish-green, with a brassy stripe above; abdomen yellowish-green, each side with an interrupted, black stripe; wings hyaline, pterostigma rhomboidal, black (♂), or luteous (♀); fifteen postcubital cross-nervules.

Length 40—33 millim. Alar expanse 48—40 millim.

Hab. Cordova, Mexico (Saussure); Venezuela (Appun).

46. A. aspersum!

Agrion aspersum Hagen!

Black, varied with blue; head black, in front and an occipital point each side blue; posterior margin of the prothorax subexcised each side; dorsum of the thorax black, each side with a broad blue stripe; sides blue; feet pale blue, femora exteriorly, tibiæ interiorly and tarsi almost entirely black; abdomen black, the sides blue; segment 1 blue, with a quadrangular, basal, black spot; 2 blue, with an apical, pyriform, black spot; 3 blue, with a large, apical, reversed hastiform, black spot; the apical half of 7, the whole of 8 and 9, and 10 with a large ovate spot each side blue; margin of the tenth segment subexcised; appendages black, superior ones long, straight, cylindrical, the apex subincurved, with a basal process beneath, which is large, laminated; the inferior appendages are short, trigonal, the apex acute, curved inwards; wings hyaline, pterostigma small, rhomboidal, black; twelve postcubital cross-nervules. (♂.)

Length 35—30 millim. Alar expanse 40—36 millim.

Hab. New York; Bergen Hill, New Jersey (Guex); Chicago (Osten Sacken).

47. A. fumipenne!

Agrion fumipenne Burm.! Handb. II, 819, 7.—*Argia obscura* Rambur, Neuropt. 256, 3.

Fusco-aeneous; head in front, and an occipital spot each side blue(?); posterior margin of the prothorax rounded, each side subtruncated; dorsum of the thorax blue(?), a narrow, fusco-aeneous stripe upon the middle; sides blue(?) above fusco-aeneous, a black

line in the middle; femora within and tibiæ without pale; abdomen fusco-aeneous, margin of the tenth segment excised, beneath bituberculated; superior appendages short, obtuse, arcuated, inferior ones broader, the apex sub-bifid; or (♀) fuscous, the apex of the segments black, a blue(?) annulus at their base; no ventral spine; wings fuscous, pterostigma rhomboidal, fuscous; sixteen postcubital cross-nervules.

Length 36 millim. Alar expanse 38—45 millim.

Hab. Kentucky; Florida (Osten Sacken).

Kirby, Fauna Bor. Amer. p. 252, describes *Agrion puella* Linn. as having been taken in North America, lat. 65°; perhaps it is another species which is inextricable. The varieties captured, which he describes, are:—

Var. B. Sea-green; dorsum of the thorax black, with a green stripe each side; abdomen black, the base green, inscribed with black; feet black, beneath pale green; the pterostigma black, environed with pale. (Certainly a female.)

Var. C. Dorsum of the thorax black, each side with a whitish stripe; feet black; pterostigma black. (From the description of Kirby.)

Tribe II. **AESCHNINA.**

Wings unequal; triangles of all the wings of the same form; genital organs of the male having the anterior *hamule* connate; the penis and vesicle conjoined; genital organs of the female vaginated or exposed.

Sub-Fam. III. GOMPHINA.

Eyes distant or sub-distant; head transverse; wings unequal, the posterior ones broader; the triangle short; genital organs of the female exposed.

Division I. Labium entire.

GOMPHUS Leach.

Triangles of all the wings with no transverse veins.

Subgenus **Erpetogomphus** Selys.

The abdomen blackish, with broad, hastiform, dorsal yellow spots; the feet short; penis with no tooth beneath.

1. G. compositus!

Erpetogomphus compositus Hag.! Monog. Gomph. 400, 16 bis; pl. xx, fig. 2. Selys, Addit. Synops. 10, 21.

Pale yellow; head pale, between the eyes black; thorax pale, dorsum with two broad, approximated stripes, and another external one each side, a little incurved, black; the sides bright yellow, each side with oblique, black lines; the space between the second and third line pale; feet yellow, having a black line exteriorly, the tarsi black; abdomen black, the second segment at sides, and a dorsal, elongated spot, segments 3 to 7 with a large, hastiform spot, the eighth each side of base, and the following ones entirely, pale yellow, appendages yellow; vulvar scale short, divided; wings hyaline, subflavescent at base, pterostigma large, black. Female. Thirteen antecubital cross-nervules. 8—9 postcubital cross-nervules.

Length 46 millim. Alar expanse 62 millim. Pterostigma $3\frac{1}{2}$ millim.

Hab. Pecos River, Western Texas (Capt. Pope).

2. G. designatus!

Erpetogomphus designatus Hag.! Monog. Gomph. 401, 16 ter; pl. xx, fig. 1. Selys, Addit. Synops. 10, 26 bis.

Yellow; head pale yellow; thorax yellow, the dorsum with two subcontiguous stripes, which are broader in front, and another shorter, oblique one each side, fuscous; the sides pale, with three very narrow fuscous lines, the middle one interrupted; feet yellow, femora and tibiæ with an external streak, and the tarsi entirely black; abdomen cylindrical, slender, the dorsum blackish-fuscous, segments 2 to 7 with a large, dorsal, hastiform yellow spot; in the females the sides are interrupted with pale; the males have the four last segments subdilated, yellow, obsoletely varied with fuscous; the superior appendages contiguous, straight, the apical half narrowed, acute, the inferior one narrow, bifid, hardly shorter than the superiors, the apex recurved, obtuse; vulvar lamina with a small triangle each side; wings hyaline, their extreme bases flavescent, pterostigma large, dilated, black; thirteen antecubitals; 8—10 postcubitals; two discoidal areolets.

Length 49—51 millim. Alar expanse 66—68 millim. Pterostigma $3\frac{1}{2}$ millim.

Hab. Pecos River, Western Texas (Capt. Pope).

3. G. boa.

Erpetogomphus boa Selys! Addit. Synops. 11, 21 quart.

Yellow; head yellow; thorax yellow, varied with obscure fuscous; femora yellow, externally with a fuscous fascia, tibiæ fuscous, or yellow, with the outside black, the four anterior tarsi brownish-black; abdomen yellowish; superior appendages inflated at base, an obtuse tooth above; their apex curved inwards, obtuse, villous; the inferior one bifid, shorter; the vulvar lamina excised; wings hyaline; pterostigma pale fuscous. (From the description of De Selys Longchamps.) Male.

Length 47 millim. Alar expanse 69—72 millim.

Hab. Vera Cruz, Mexico.

4. G. cophias!

Erpetogomphus cophias Selys! Monog. Gomph. 72, 17; pl. iv, fig. 6. Selys, Addit. Synops. 11, 21 quint.

Yellow; head yellow, between the ocelli fuscous; thorax yellow, dorsum having an obsolete, humeral, rufous stripe; abdomen yellow, segments 4—9 each side blackish-fuscous; segment 10 with two basal, black spots; femora yellow, with a black fascia externally, tibiæ and tarsi black; superior appendages inflated at base, with a basal tooth beneath; at the apex they are obtuse; the inferior one bifid, shorter; wings hyaline, pterostigma pale fuscous; vulvar lamina short, each side orbicular.

Length 47 millim. Alar expanse 64 millim. Pterostigma 3 millim.

Hab. Mexico; Trojes del Oro (Saussure).

5. G. elaps!

Erpetogomphus claps Selys! Monog. Gomph. 70, 16; pl. iv, fig. 4. Selys, Addit. Synops. 12, 21 sext.

Yellow; head yellow, between the ocelli fuscous; thorax yellow, dorsum each side with an obsolete, humeral, rufous vestige; femora yellow, externally with a black fascia, tibiæ and tarsi black; abdomen slender, yellowish, before the apex dilated, the second segment each side, lineated with black, and with a trilobed, dorsal, yellow spot; segments 3—6 blackish, with a yellow, basal ring, or yellow with an apical black ring (teneral), segment 7 yellow, or sometimes fuscous behind, segments 8—10 fuscous, obscurely varied with black; superior appendages contiguous, not inflated at base, the

apex obtuse, subincurved; the inferior one bifid, one-half shorter than the superior; wings hyaline, pterostigma fuscous or fulvous. Male.

Twelve antecubitals; 8—9 postcubitals; two discoidal areolets.

Length 41 millim. Alar expanse 54 millim. Pterostigma 3 millim.

Hab. Atlihuazan, Mexico (Saussure).

6. **G. crotalinus!**

Erpetogomphus crotalinus Hag.! Monog. Gomph. 72, 18; pl. iv, fig. 5. Selys, Synops. 21, 21.—*Ophiogomphus menetriesii* Selys! Synops. 20, 20.

Greenish-yellow; head and thorax greenish-yellow; feet yellow, exteriorly lineated with black, tarsi black; abdomen slender, before the apex dilated, greenish-yellow, with a black stripe each side; superior appendages straight, contiguous, inflated at base, the apex acute; the inferior one bifid, the apex incurved, acute; vulvar lamina excised; wings hyaline, pterostigma yellow, surrounded by black nervures.

Eleven antecubitals; 8—9 postcubitals; two discoidal areolets.

Length 45—49 millim. Alar expanse 66 millim. Pterostigma $3\frac{1}{4}$ millim.

Hab. Mexico; Brazil.

G. menetriesii, from Brazil, very likely, does not differ from this species; but the typical specimen being destroyed, other specimens are to be observed.

Subgenus **Ophiogomphus** Selys.

7. **G. colubrinus!**

Ophiogomphus colubrinus Selys! Monog. Gomph. 76, 19; pl. v, fig. 1. Selys, Synops. 21, 22.

Greenish-yellow; head yellow, in front with four black lines, labium black in the middle; thorax greenish-yellow, a middle stripe, and another each side, lateral, narrow, fuscous; sides, each with three narrow black lines; feet yellow, the posterior femora exteriorly fuscous, tibiæ black with an external yellow line; abdomen cylindrical, before the apex dilated, the dorsum black, segments 3—7 with a basal yellow stripe, the rest with a yellow spot; superior appendages yellow, short, trigonal, subincurved; the in-

ferior one broad, bifid, hardly shorter; wings hyaline, pterostigma pale fuscous. Male.

Fourteen antecubitals; 11—12 postcubitals; two discoidal areolets.

Length 50 millim. Alar expanse 64 millim. Pterostigma 3 millim.

Hab. Hudson's Bay.

This species is very much like *G. serpentinus* Charp., of Europe.

Subgenus **Gomphus.**

8. G. spinosus!

Gomphus spinosus Selys! Monog. Gomph. 120, 35; pl. vii, fig. 2. Selys, Synops. 40, 51.

Fuscous, spotted with yellow; head yellow, with a black band before the eyes; dorsum of the thorax fuscous, a medial stripe dilated in front, and a subcontiguous streak each side, yellow; sides yellowish; feet black, the anterior femora beneath yellowish; posterior femora extremely long, spinous; abdomen long, yellow, a broad, brownish-black stripe upon each side; superior appendages divaricated, trigonal, the apex acute, recurved, upon the under side on the middle, a blunt tooth; the inferior one broad, forked; the vulvar lamina narrow, bifid; wings hyaline, pterostigma large, yellow; 13—14 antecubitals; eleven postcubitals; two discoidal areolets.

Length 54—61 millim. Alar expanse 76—80 millim. Pterostigma 4 millim.

Hab. Georgia.

9. G. armatus.

Gomphus armatus Selys! Monog. Gomph. 122, 36. Selys, Synops. 40, 52.

Fuscous, spotted with yellow; head yellow, front with a transverse black line inferiorly; thorax fuscous, a middle stripe, dilated in front, and a humeral and antehumeral streak, yellow; sides yellow, with two fuscous stripes; feet black, anterior femora yellowish beneath; posterior femora extremely long, spinous; abdomen long, the apex very much dilated, yellow, a broad brownish-black stripe each side; appendages like those of *G. spinosus*, pale fuscous; wings hyaline; pterostigma large, yellow. Male.

Fifteen antecubitals; ten postcubitals; two discoidal areolets.

Length 54 millim. Alar expanse 76 millim. Pterostigma 4 millim.

Hab. North America (British Museum).

10. G. spoliatus!

Gomphus spoliatus Hag.! Monog. Gomph. 409, 36 bis; pl. xxi, fig. 1. Selys, Addit. Synops. 17, 32 bis.

Yellow, spotted with fuscous; head yellow; thorax yellow, dorsum with two medial, contiguous, anteriorly broadened stripes, and two oblique ones each side, fuscous; sides yellow, with fuscous, oblique lines each side; feet black, the anterior and posterior pairs of femora yellowish beneath; the posterior femora extremely long, spinous; abdomen long, slender, the apex very much dilated, yellow, the second segment each side, with a large angular spot, segments 3—6 each side, with a point and apical triangular spot, black; appendages like those of *G. spinosus*, yellow; wings hyaline, pterostigma large, yellow. Male.

13—14 antecubitals; 8—10 postcubitals; two discoidal areolets.

Length 60 millim. Alar expanse 74 millim. Pterostigma $3\frac{1}{2}$ millim.

Hab. Pecos River, Western Texas (Capt. Pope).

Is this not the teneral stage of *G. armatus?*

11. G. dilatatus!

Gomphus dilatatus Ramb.! Neuropt. 155, 2. Selys! Monogr. Gomph. 123, 37; pl. vii, fig. 3. Selys, Synops. 28, 31.

Black, spotted with yellow; head yellow, with two stripes in front and a third before the eyes, black; dorsum of the thorax black, with two yellow stripes each side; sides yellow, each side with two oblique black streaks; feet black, anterior femora beneath yellowish; the posterior femora longer; abdomen slender, long, the apex strongly dilated, excavated, black, segments 1—7 with a dorsal middle fascia, segments 1—3 each side with a lateral fascia and segment 9 at the sides, yellow; appendages black, superior ones short, cylindrical, incurved, the apex beneath, obliquely truncated, acute; the inferior one broad, bifid; wings hyaline, pterostigma moderate, black; the membranule broader, cinereous; vulvar lamina long, excised, bifurcated; thirteen antecubitals; fourteen postcubitals; two discoidal areolets.

Length 65—72 millim. Alar expanse 84 millim. Pterostigma $3\frac{1}{2}$—4 millim.

Hab. Georgia (Abbot).

12. G. externus!

Gomphus externus Hag.! Monog. Gomph. 411, 37 bis; pl. xxi, fig. 2. Selys, Addit. Synops. 14, 31 bis.

Yellow, spotted with black; head yellow, a narrow black band before the eyes; thorax yellow, dorsum with a straight middle stripe, and two each side, incurved, black; sides yellow, each side with two oblique black stripes; feet black, anterior femora upon the base beneath, yellowish, tibiæ at the base exteriorly, yellow; abdomen long, the apex dilated; yellow, each side with a broad black stripe, which is conjoined upon the dorsum at the apex of the segments; appendages fuscous, superior ones short, trigonal, acute; the inferior one broader, bifurcated; vulvar lamina narrow, the apex bifid; wings hyaline, pterostigma narrow, fuscous; 11—12 anteenbitals; 9—10 posteubitals; two discoidal areolets.

Length 52 millim. Alar expanse 66 millim. Pterostigma 3 millim.

Hab. Pecos River, Western Texas (Capt. Pope).

13. G. adelphus.

Gomphus adelphus Selys! Monog. Gomph. 413, 38 bis. Selys, Addit. Synops. 15, 34 ter.

Yellow, spotted with black; head yellow, in front with two confluent black bands; thorax yellow, dorsum each side, with three black stripes, the intermediate ones contiguous; feet black; apex of the abdomen dilated, dorsum black, segments 1—7 with a maculose, median, yellow stripe; appendages black, superior ones incurved at the apex, acute; wings hyaline, pterostigma small, fuscous. Male. (From the description of De Selys Longchamps.)

Length 48 millim. Alar expanse 54 millim. Pterostigma 2 millim.

Hab. New York (Asa Fitch).

14. G. fraternus!

Æschna fraterna Say, Journ. Acad. Philad. VIII, 16, 9.—*Gomphus fraternus* Selys! Monog. Gomph. 125, 138; pl. vii, fig. 4. Selys, Synops. 28, 32.

Yellow, spotted with black; head yellow, thorax yellow, dorsum

with a stripe upon the middle, and one each side, laterally, broad, black, divided with yellow; feet black, the anterior and posterior femora partly yellowish; abdomen dilated at the apex, black, a dorsal line broader at the base, yellow, at the apex wanting; a basal, lateral yellow stripe, and the eighth and ninth segments, each side, yellow; appendages black; vulvar lamina narrow, two-parted; wings hyaline, pterostigma yellow; twelve antecubitals; 10—11 postcubitals; two discoidal areolets.

Length 48 millim. Alar expanse 64 millim. Pterostigma 3 millim.

Hab. New York (Schaum); Virginia (Osten Sacken).

15. G. villosipes!

Gomphus villosipes Selys! Synops. 34, 41.—*Gomphus pallidus* Selys! Monog. Gomph. 145, 47; pl. viii, fig. 6. (partly.)

Greenish-yellow, spotted with black; head yellowish, with a black stripe in front; thorax greenish-yellow, dorsum with a stripe upon the middle, and a lateral, broad one, each side, divided with yellow, black; sides with an interrupted, black line; feet black, anterior femora beneath yellowish, tibiæ with an external yellow line; apex of the abdomen a little dilated, dorsum of the abdomen black, with a maculose, yellow stripe upon the middle; segments 8 and 9 black, 10 yellow; appendages yellowish, black at apex, the superior ones divaricated, deplanated, the apex acute and curved inwards; the inferior one broadly forked, the apex recurved; wings hyaline, pterostigma yellow. Male.

Eleven antecubitals; ten postcubitals; three discoidal areolets.

Length 47 millim. Alar expanse 59 millim. Pterostigma $3\frac{1}{2}$ millim.

Hab. North America (Vienna Museum).

16. G. pallidus!

Gomphus pallidus Ramb.! Neuropt. 163, 12. Selys! Monog. Gomph. 145, 47; pl. viii, fig. 6 (Partly). Selys! Synops. 33, 40.

Testaceous; head pale; thorax villous, olivaceous, dorsum each side, with an obsolete rufous line; feet testaceous, femora above and tibiæ beneath blackish-brown; abdomen long, the ninth segment longer than the others; apex hardly dilated, testaceous, each side with a broader subfuscous stripe, which is wanting at the

apex; appendages pale; vulvar lamina triangular, the apex bifid; wings hyaline, pterostigma narrow, longer, yellow. Female.

Twelve antecubitals; ten postcubitals; two discoidal areolets.

Length 58 millim. Alar expanse 76 millim. Pterostigma 5 millim.

Hab. Georgia (Abbot).

17. G. pilipes!

Gomphus pilipes Selys! Monog. Gomph. 148, 48; pl. viii, fig. 7. Selys! Addit. Synops. 15, 40 bis.

Testaceous; head pale; thorax villous, olivaceous, dorsum each side, with an obsolete fuscous line; feet testaceous, femora villous, above, and tibiæ beneath, blackish-brown; abdomen long, the ninth segment longer than the others, the apex hardly dilated; testaceous, the middle segments at the apex, and the basal segments each side, with an obsolete fuscous fascia; appendages pale, the superior ones trigonal, the apex acute, curved inwards; the inferior ones broadly bifurcated; vulvar lamina oblong, bifid at the apex; wings hyaline, pterostigma narrow, yellow; twelve antecubitals; eleven postcubitals; 3 discoidal areolets.

Length 53 millim. Alar expanse 68 millim. Pterostigma 4 millim.

Hab. New Orleans; Georgia.

18. G. lividus!

Gomphus lividus Selys! Monog. Gomph. 150, 49; pl. ix, fig. 1. Selys! Synops. 34, 42.—*Gomphus sordidus* Hag.! Selys, Synops. 35, 43.

Olivaceous, spotted with fuscous; head pale yellow; thorax olivaceous, the dorsum with a stripe upon the middle, each side a broad, fuscous one, divided with olive; the sides with two broad, fuscous lines; feet testaceous, tibiæ beneath and the tarsi, black; abdomen equal, the base dilated, fuscous, a dorsal, medial, yellow line, interrupted upon the segments, and absent from the apex; appendages fuscous, the superior ones trigonal, narrower at the apex, acute, somewhat dilated in the middle; the inferior one broadly bifid; wings hyaline, pterostigma small, yellow; twelve antecubitals; twelve postcubitals; two discoidal areolets.

Length 51 millim. Alar expanse 66 millim. Pterostigma 3 millim.

Hab. S. Carolina (Zimmerman); Washington (Osten Sacken).

A male from Washington has the appendages a little different; the specimen, however, is a very freshly excluded one; perhaps it belongs to this same species.

19. G. spicatus!

Gomphus spicatus Hag.! Monog. Gomph. 153, 50, and 415, 50; pl. ix, fig. 2. Selys! Synops. 35, 44.

Fuscous, spotted with luteous; head pale yellow; thorax clothed with fuscous hairs, dorsum with a stripe each side and the sides with two stripes, luteous; femora luteous, above fuscous; tibiæ blackish-fuscous, exteriorly yellowish, tarsi black; abdomen equal, inflated at base, fuscous, the dorsum with an interrupted, yellow line, the base each side with a yellow stripe; appendages fuscous, the superior ones trigonal, acute at the apex, with an external, basal tooth; the inferior one broader, divaricated, broadly bifid; the vulvar lamina triangular, bifid, subdivaricated; wings hyaline, pterostigma yellow; twelve antecubitals; ten posteubitals; two discoidal areolets.

Length 49 millim. Alar expanse 60 millim. Pterostigma 3 millim.

Hab. New York (Schaum); Canada.

20. G. militaris!

Gomphus militaris Hag.! Monog. Gomph. 416, 51 bis; pl. xxi, fig. 3. Selys! Addit. Synops. 16, 44 bis.

Yellow, spotted with blackish-brown; head pale yellow; thorax yellow, dorsum each side with a lateral stripe, which is broad, blackish-fuscous, divided with yellow; the sides with two brownish-black lines; feet yellowish, the femora bilineated with black, the tibiæ within, and the tarsi black; abdomen slender, yellow, dilated at the apex, an interrupted brownish-black line each side, which is absent at the apex; appendages yellow, the superior ones trigonal, the apex curved inwards, acute, with an external obtuser tooth; the inferior appendage broadly bifid; vulvar lamina extremely short, excised; wings hyaline, pterostigma yellow; 12—14 antecubitals; eleven posteubitals; two discoidal areolets.

Length 47—50 millim. Alar expanse 64 millim. Pterostigma 4 millim.

Hab. Pecos River, Western Texas (Capt. Pope).

21. G. intricatus!

Gomphus intricatus Hag.! Monog. Gomph. 418, 51 ter; pl. xxi, fig. 3. Selys! Addit. Synops. 16, 44 ter.

Yellow, spotted with brownish-black; head pale yellow; thorax yellow, dorsum with a medial fascia, divided with yellow, each side an incurved fascia, and a humeral one, brownish-black; femora yellow, with a fuscous stripe above, tibiæ black, exteriorly yellow, tarsi black; abdomen slender, broader at the apex; yellow, each side with an interrupted, fuscous stripe, which is absent at the apex; appendages yellow, the superior ones divaricated, the apex, outwardly, truncated, acute, the inferior appendage broadly bifid; wings hyaline, pterostigma yellow. Male.

Twelve antecubitals; eight postcubitals; two discoidal areolets.

Length 45 millim. Alar expanse 60 millim. Pterostigma 3 millim.

Hab. Pecos River, Western Texas (Capt. Pope).

22. G. minutus!

Gomphus minutus Ramb.! Neuropt. 161, 9. Selys! Monog. Gomph. 155, 51; pl. ix, fig. 3. Selys! Synops. 36, 45.

Yellow, spotted with black; head yellow; thorax yellow, dorsum with a medial fascia, and a broad lateral one each side, black, divided with yellow, the sides with two, almost contiguous, oblique, black stripes; feet yellow, femora exteriorly, the tibiæ interiorly and the tarsi, black; the abdomen somewhat broader at the apex, yellow, each side with a broad black stripe; appendages yellowish, fuscous at the apex, the superior ones trigonal, with a long, basal tooth beneath; the inferior one broadly bifid; vulvar lamina very short, excised; wings hyaline, pterostigma yellow; twelve antecubitals; eleven postcubitals; two discoidal areolets.

Length 49 millim. Alar expanse 60 millim. Pterostigma 3 millim.

Hab. Georgia (Abbot).

23. G. exilis!

Gomphus exilis Selys! Monog. Gomph. 156, 52. Selys! Synops. 36, 46.

Yellow, marked with blackish-fuscous; head yellow; thorax yellow, dorsum with a broad middle stripe and each side of it a broad lateral one, each divided with yellow, fuscous; sides yellow, with a broad, oblique, fuscous fascia; feet yellow, femora exte-

riorly, tibiæ interiorly, and the tarsi, brownish-black; abdomen with the apex a little dilated, the dorsum blackish-fuscous, with a medial yellow stripe; appendages yellow, superior ones trigonal, dilated and toothed beneath; the inferior one broadly bifid; vulvar lamina oval, short, bifid; wings hyaline, pterostigma yellow; nine antecubitals; eight postcubitals; two discoidal areolets.

Length 42 millim. Alar expanse 50 millim. Pterostigma $2\frac{1}{2}$ millim.

Hab. Maryland (Uhler); Massachusetts (Scudder).

24. G. parvulus.

Gomphus parvulus Selys! Monog. Gomph. 157, 53; pl. xxii, fig. 1. Selys! Synops. 37, 47.

Black; head black, a fascia in front, and two spots, yellow; thorax black, dorsum each side, with a small, yellow line; sides yellow, with two contiguous stripes and a third posteriorly, black; feet black; abdomen equal, black, the dorsum with a basal, maculose, yellow stripe; appendages fuscous, superior ones nearly straight, cylindrical, the apex narrower, acute, beneath with a basal tooth; the inferior one-half shorter, broadly bifid; wings hyaline, pterostigma blackish-fuscous. (Male.)

Thirteen antecubitals; eleven postcubitals; two discoidal areolets.

Length 40 millim. Alar expanse 54 millim. Pterostigma 3 millim.

Hab. Nova Scotia (British Museum).

25. G. plagiatus.

Gomphus plagiatus Selys! Monog. Gomph. 159, 54. Selys! Synops. 38, 48.

Yellow, spotted with black; head yellow; dorsum of the thorax black, each side with a yellow stripe; sides yellow, with two black lines; femora yellow, the basal half exteriorly black, tibiæ and tarsi black; abdomen long, the apex subdilated, luteous; segments 7—9 yellow, with a red apex; appendages yellow, like those of *G. villosipes;* wings hyaline, pterostigma yellow. (From the description of De Selys Longchamps.)

Fourteen antecubitals; eight postcubitals; two discoidal areolets.

Length 54 millim. Alar expanse 64 millim. Pterostigma ? millim.

Hab. North America (British Museum).

26. G. notatus.

Gomphus notatus Ramb.! Neuropt. 162, 10. Selys! Monog. Gomph. 159, 55. Selys! Synops. 38, 49.—*Gomphus elongatus* Selys! Synops. 39, 50 (♀).

Greenish-yellow, spotted with fuscous; head yellowish; dorsum of the thorax fuscous, each side with narrow green stripes; sides greenish-yellow, with two fuscous stripes; feet yellow, femora above, fuscous, tibiæ and tarsi, black; abdomen long, cylindrical, fuscous; vulvar lamina short; wings hyaline, pterostigma long, rufous. (From the description of De Selys Longchamps.)

13—15 antecubitals; eleven postcubitals; two discoidal areolets.

Length 64 millim. Alar expanse 68—78 millim. Pterostigma 5 millim.

Hab. North America (British Museum).

Subgenus **Neogomphus** Selys.

27. G. specularis!

Neogomphus? specularis Hag.! Selys, Addit. Synops. 18, 64 bis.

Yellow, spotted with black; head yellow in front, above black, in the middle yellow; thorax yellow, dorsum each side, with a broad, black stripe; sides yellow; feet black; abdomen equal, black, the dorsum with a narrow yellow stripe, which is almost absent upon the apex, segments 8 and 9 with a yellow spot each side; appendages yellow; vulvar lamina large, bifid, bi-ovate; wings hyaline, pterostigma black. Female.

10—11 antecubitals; 10—11 postcubitals; two discoidal areolets.

Length 45 millim. Alar expanse 58 millim. Pterostigma 3 millim.

Hab. Ft. Tejon, California (John Xantus).

PROGOMPHUS Selys.

Triangles with transverse veins; the superior side longer than the interior one; the feet short.

1. P. obscurus!

Diastatomma obscurum Ramb.! Neuropt. 170, 5.—*Progomphus obscurus* Selys! Monog. Gomph. 201, 70. Selys! Synops. 53, 69.

Fuscous, spotted with yellow; head yellow, fuscous above; dor-

sum of the thorax fusco-rufous, each side with a yellow stripe; sides fuscous, with three yellow stripes; feet fusco-rufous, femora luteous beneath, tibiæ within and the tarsi black; abdomen ?

; wings hyaline, with a fulvous, narrow, basal spot, pterostigma large, rufo-fuscous. (From the description of De Selys Longchamps.)

15—16 antecubitals; 9—11 postcubitals; two discoidal areolets.

Length 53 ? millim. Alar expanse 70 millim. Pterostigma 5 millim.

Hab. North America (Vienna Museum; collection of De Selys Longchamps).

2. P. zonatus!

Progomphus zonatus Hag.! Monog. Gomph. 203, 71; pl. xi, fig. 3. Selys! Synops. 53, 70.

Black, spotted with yellow; head yellow in front, above black; thorax black, dorsum each side with two stripes, and sides with three broader stripes, yellow; feet black; abdomen long, cylindrical, the base subinflated, black, the dorsum with a basal yellow line, the base of segment 7 yellow; appendages yellow; vulvar lamina very short, emarginated; wings fumose, pterostigma large, black. Female.

17—18 antecubitals; 9—11 postcubitals; two discoidal areolets.

Length 52 millim. Alar expanse 70 millim. Pterostigma 5 millim.

Hab. Mexico (collection of Dr. Hagen).

GOMPHOIDES Selys.

Triangles with transverse veins; the superior side shorter than the others; feet short.

1. G. stigmata!

Æschna stigmata? Say, Journ. Acad. Philad. VIII, 17, 10.—*Progomphus stigmatus* Selys! Monog. Gomph. 205, 72. Selys, Synops. 53, 71.—*Gomphoides stigmata* Hag.! Monog. Gomph. 423, 72; pl. xxi, fig. 5.

Yellow, marked with black; head yellow, above fuscous, the vertex yellow; thorax yellow, dorsum with a stripe in the middle, two each side, and sides with two oblique stripes, black; feet black, femora yellow, bilineated with black at the apex; abdomen slender, inflated at the base, the apex dilated, yellow, segments 2 to 7 each

side with a black apical fascia, which meet at the tip; segments 8 and 9 fuscous in the middle; appendages yellow, superior ones cylindrical, incurved at the apex, and with an ante-apical tooth above; the inferior appendage short, orbicular, bifid; vulvar lamina short, excised; wings hyaline, pterostigma large, black; 17—19 antecubitals; 10—12 postcubitals; two discoidal areolets.

Length 65 millim. Alar expanse 84 millim. Pterostigma 5 millim.

Hab. Pecos River, Western Texas (Capt. Pope).

2. G. suasa.

Gomphoides suasa Selys, Addit. Synops. 19, 72 bis.

Fusco-olivaceous; thorax fusco-olivaceous, a dorsal stripe each side, another humeral, and the sides with three bands, yellowish; feet grayish-fuscous, femora paler; abdomen fusco-olivaceous, an interrupted dorsal line, spots at the sides (those of the seventh segment larger) yellow; the eighth and ninth segments not dilated; appendages pale; wings hyaline, pterostigma fuscous. ♀. (From the description of De Selys Longchamps.)

antecubitals; postcubitals; discoidal areolets.

Length 58 millim. Alar expanse 86 millim. Pterostigma 5 millim.

Hab. Vera Cruz, Mexico (Sallé).

3. G. perfida!

Gomphoides perfida Hagen.

Black, spotted with luteous; head luteo-fuscous; thorax luteous, dorsum with a middle fascia, and each side a lateral one, broad, black, divided with luteous; sides black, with three oblique, luteous stripes; feet black, base of the femora luteo-fuscous; abdomen slender, the base broader (the apex destroyed); black, the dorsum of the first and second segments, and sides, obsoletely luteous; wings fumose, pterostigma large, black. (Male.)

23—24 antecubitals; fifteen postcubitals; two discoidal areolets.

Length 60 ? millim. Alar expanse 82 millim. Pterostigma 5 millim.

Hab. Tampico, Mexico (Saussure).

4. G. elongata.

Cyclophylla elongata Selys! Monog. Gomph. 224, 84; pl. xii, fig. 5. Selys! Addit. Synops. 20, 79 ter.

Black, spotted with olive; head olivaceous in front, labrum margined with black, and with a black fascia upon the middle; thorax black, dorsum each side with two narrow stripes, and each side with three stripes, olivaceous; feet black, anterior femora pale beneath; abdomen long, slender, black, the base and apex inflated, segments 3—7 with a basal, hastiform, yellow spot; appendages brownish-black, subcylindrical, forcipated, the apex subexcised, the inferior appendage scarcely apparent; wings hyaline, pterostigma large, rufo-fuscous. ♂. Sixteen antecubitals; ten postcubitals; two discoidal areolets. (From the description of De Selys Longchamps.)

Length 62 millim. Alar expanse 72 millim. Pterostigma 5 millim.

Hab. Mexico (Paris Museum).

5. G. protracta!

Cyclophylla protracta Hagen! Selys, Addit. Synops. 20, 79 ter.

Blackish-fuscous, spotted with yellow; head luteous; thorax blackish-fuscous, dorsum with two stripes, and the sides with three oblique ones, yellow; feet brownish-black, femora luteous; abdomen long, slender, inflated at base, fuscous or luteous, membranously dilated at the apex, dorsum with an interrupted, yellow line, the sides luteous; appendages fuscous, subcylindrical, forcipated, subexcised at the apex, the inferior appendage absent; vulvar lamina very short, excised; wings hyaline, pterostigma large, yellow. Twenty-one antecubitals; ten postcubitals; two discoidal areolets.

Length 62 millim. Alar expanse 79 millim. Pterostigma 5 millim.

Hab. Matamoras, Mexico.

6. G. producta!

Aphylla producta Selys! Monog. Gomph. 230, 83; pl. xii, fig. 6. Selys! Synops. 60, 81. *Aphylla caraiba* Selys! Poey, Ins. Cuba, 456.

Brownish-black, spotted with yellow; head yellow, banded transversely with fuscous; thorax brownish-black, dorsum each side with

two stripes, conjoined at the wings, the external one narrower, and the sides with three oblique ones, the middle one incomplete, yellow or green; feet black, femora rufous, obscurer at the apex; abdomen long, slender, the base inflated, the apex somewhat broader, brownish-black, the base with a yellow, dorsal line; appendages black, subcylindrical, forcipated, obtuse at the apex, the inferior one almost absent; ventral lamina narrow, bifid; wings hyaline, the pterostigma large, yellow. 19—23 antecubitals; 11—15 postcubitals; 2 discoidal areolets.

Length 59—65 millim. Alar expanse 76—84 millim. Pterostigma 5 millim.

Hab. Cuba (Poey); British Guiana (Schomburgk); Bahia, Brazil.

7. G. tenuis!

Aphylla tenuis Hagen! Selys, Addit. Synops. 21, 80 bis.

Luteous; head luteo-fuscous; dorsum of the thorax fuscous, sides luteous; feet black, femora luteous; abdomen long, slender, equal, subinflated at base, luteo-fuscous, the segments obscurer at their apex; appendages fuscous, subcylindrical, forcipated, the apex acuter; the inferior appendage absent; wings hyaline, pterostigma large, luteous. Male. 19—22 antecubitals; 12—13 postcubitals; 2 discoidal areolets.

Length 50 millim. Alar expanse 67 millim. Pterostigma 4 millim.

Hab. Choco, New Grenada (Schott).

The specimen is teneral, the colors hardly perfected, preserved in spirits.

HAGENIUS Selys.

Triangles with transverse veins; the superior side longer than the interior; feet very long.

1. H. brevistylus!

Hagenius brevistylus Selys! Monog. Gomph. 241, 86; pl. xiii, fig. 2. Selys! Synops. 63, 84.

Black, spotted with yellow; head yellow in front, a black fascia before the eyes, above black; thorax black, dorsum each side with

a stripe and line, and the sides with two broad oblique stripes, a line between them, yellow; feet very long, black; abdomen long, cylindrical, the dorsum black, with a stripe upon the middle, and each side a ventral one, yellow; appendages short, yellow, the superior ones stout, incurved at apex, bidentated beneath, the inferior appendage quadrangular, broad, incurved at the apex; wings subfumose, pterostigma long, brownish-black. 16—19 antecubitals; 13—14 postcubitals; 2 discoidal areolets.

Length 73—78 millim. Alar expanse 104—114 millim. Pterostigma 6 millim.

Hab. New York (Dr. Asa Fitch); Wisconsin (Kennicott); Columbia.

Division II. Labium bifid.

CORDULEGASTER Leach.

Eyes subcontiguous.

1. C. sayi.

Cordulegaster sayi Selys! Monog. Gomph. 331, 109. Selys! Synops. 85, 106.

Black, spotted with yellow; head yellow, rhinarium black; thorax black, dorsum with two stripes, sides each with two stripes and an intermediate line, yellow; feet black; abdomen long, black, annulated with yellow; appendages of the male black, superior ones trigonal, divaricated, with a basal tooth beneath, the inferior appendage quadrangular; appendages of the female yellow; vulvar lamina elongated, bifid; wings hyaline, pterostigma long, yellow; membranule whitish. 18 antecubitals; 11 postcubitals; 2 discoidal areolets.

Length 60 millim. Alar expanse 84 millim. Pterostigma $4\frac{1}{4}$ millim.

Hab. Georgia (British Museum).

It is similar to C. *annulatus* Charp., of Europe.

2. C. maculatus!

Cordulegaster maculatus Selys! Monog. Gomph. 337, 111. Selys! Synops. 86, 108. *Aeschna obliqua* Say, var. A? Jour. Acad. Philad. VIII. 16, 8.

Brownish-black, hairy, spotted with yellow; head yellow, with

a fuscous band in front; thorax brownish-black, dorsum each side with a cuneiform stripe, sides with two oblique stripes, yellow; feet black, femora fuscous, the apex black; abdomen long, brownish-black, segments 2—6 with a dorsal, yellow spot each side; vulvar lamina long, bifid, yellow, fuscous at the apex; wings hyaline, pterostigma yellow, membranule white. Female. 21 antecubitals; 15 postcubitals; 2 discoidal areolets.

Length 75 millim. Alar expanse 93 millim. Pterostigma 4 millim.

Hab. Georgia; Maryland (Uhler); Connecticut (Norton).

3. C. dorsalis!

Cordulegaster dorsalis Hagen! Monog. Gomph. 347, 115. Selys! Addit. Synops. 28, 113 bis.

Fuscous, spotted with yellow; head yellow, with a fuscous band in front; thorax fuscous, dorsum each side with a stripe, sides with two oblique ones, yellow; feet blackish-fuscous, femora luteous; abdomen long, fuscous, segments 2—9 with a dorsal, bifid, yellow spot; vulvar lamina long, bifid, luteous; wings hyaline, the base subfulvous, pterostigma yellow, membranule white. Female. Eighteen antecubitals; twelve postcubitals; two discoidal areolets.

Length 80 millim. Alar expanse 100 millim. Pterostigma 4 millim.

Hab. Sitka, Russian America.

4. C. obliquus!

Æschna obliqua Say, Jour. Acad. Philad. VIII, 15, 8.—*Cordulegaster obliquus* Selys! Monog. Gomph. 349, 116; pl. xviii, fig. 5. Selys! Synops. 89, 113.—*Cordulegaster fasciatus* Ramb.! Neuropt. 178, 1.

Black, spotted with greenish-yellow; head yellow, in front with two black bands, occiput tuberculoid; thorax black, with gray hairs, dorsum with a cuneiform stripe each side, and sides with two oblique stripes, yellow; feet black, base of the femora fuscous; abdomen long, equal, black, dorsum with a greenish-yellow line upon the middle, which is dilated in the middle upon segments 5—8; appendages black, superior ones short, trigonal, acute, with a basal tooth beneath; the inferior one quadrangular, the apex tuberculated each side; vulvar lamina short, bifid, yellow, black at the apex; wings hyaline, pterostigma long, fulvous, membranule

whitish. Twenty-six antecubitals; 17—20 postcubitals; two discoidal areolets.

Length 83—88 millim. Alar expanse 112—124 millim. Pterostigma 6 millim.

Hab. Indiana (Say); Georgia (Abbot); Connecticut (Norton).

PETALURA Leach.

Pterostigma extremely long.

1. P. thoreyi!

Uropetala thoreyi Hagen! Monog. Gomph. 373, 122; pl. xix, fig. 3.—*Tachopteryx obscura* Uhler MSS.—*Tachopteryx thoreyi* Selys! Addit. Synops. 25, 116 bis.

Olivaceous, spotted with black; head pale in front, with a black band, and above black; thorax olivaceous, the sides with two obsolete black stripes; feet black; abdomen long, equal, olivaceous, dorsum of the second segment with two spots, the following ones with a spot upon the basal middle, an apical ring, and the last segments almost altogether black; appendages black, superior ones dolabriform, the inferior quadrangular, with a basal tooth above, and the apex each side unguiculated; wings hyaline, pterostigma narrow, very long, fulvous. Male. 18—20 antecubitals; 11—13 postcubitals; three discoidal areolets.

Length 78 millim. Alar expanse 100 millim. Pterostigma 9 millim.

Hab. New York; Maryland (Uhler); Fort Towson, Red River.

Subfamily IV. AESCHNINA.

Eyes contiguous; head globose; wings unequal, the posterior ones broader; triangles long; genital organs of the female vaginated.

ANAX Leach.

Anal angle of the posterior wings rounded in the male; second segment of the abdomen not auriculated; abdomen with a lateral, interrupted carina.

1. A. junius!

Libellula junia Drury, Ins. I, 112; pl. xlvii. fig. 5.—*Aeschna junia* Burm.! Handb. II, 841, 18. Say, Jour. Acad. Philad. VIII, 10, 2. Ramb. Neuropt. 196, 6.—*Anax junius* Selys! Revue Odonat. Europ. 328. Selys! Poey, Ins. Cuba, 458.—*Anax spiniferus* Ramb.! Neuropt. 186, 4; pl. i. fig. 14.

Green, spotted with blue and fuscous; head yellow, above with a black spot, and circular blue band; thorax green; feet black, femora partly rufous; abdomen long, subdepressed, equal, the base very much inflated, narrowed beyond, the first segment and base of the second green, the rest blue, with a dorsal, fuscous fascia, interrupted, and in part angulose; appendages fuscous, superior ones of the male long, straight, towards the apex somewhat broader, with an external spine at the apex, the inferior appendage very short, quadrangular, transverse; wings hyaline, flaveseent upon the middle, pterostigma long, yellow, narrow; membranule large, brownish-black, with the base white; seventeen antecubitals; eight postcubitals.

Length 68—74 millim. Alar expanse 104—110 millim. Pterostigma 7 millim.

Hab. New York; Maryland; New Jersey; Kentucky; Georgia; Florida; Louisiana; St. Louis; S. Carolina; Pecos River, Texas; Matamoras, Mexico; San Francisco, California; Cuba; Oahu, Sandwich Islands; Kamtschatka; Petcheli Bay, China.

A common and wide-spread species. Rambur erroneously gives Europe as its *habitat*.

2. A. longipes!

Anax longipes Hagen!

Green, spotted with blue and fuscous; head yellow, above immaculate; thorax green; feet extremely long, black, femora rufous, with the apex black; abdomen long, subdepressed, equal, the base inflated, green; surface fuscous, each side of the segments having an apical, yellow spot, beneath yellowish, apex of the segments fuscous; appendages short, foliaceous, fuscous; wings hyaline, pterostigma yellow; membranule brownish black, white at the base; nineteen antecubitals; nine postcubitals.

Length 80 millim. Alar expanse 105 millim. Pterostigma $5\frac{1}{2}$ millim.

Hab. Georgia (Abbot, Zurich Museum).

3. **A. amazili.**

Aeschna amazili Burm.! Handb. II, 841, 19, *Anax maculatus* Ramb. Neuropt. 188, 7.

Green, spotted with black; head in front greenish-yellow, the labrum margined with black; front above, with a triangular, black spot, bounded by yellow, each side a triangular blue spot; thorax bright green; feet black, anterior femora luteous beneath; abdomen long, stout, equal, the base inflated, blue? (♂) or green (♀), segments 3 to 10 with a broad, black, dorsal fascia, narrower upon the middle of the segments; segments 3—7, with two blue or green spots each side, the last segments almost entirely black; appendages black, superior ones of the male long, carinate, villose within, the base narrow, the internal margin dilated, before the apex excised, the apex exteriorly recurved, obliquely truncated, acute; the inferior appendage very short, transverse, quadrangular; appendages of the female shorter, foliaceous; wings hyaline, pterostigma short, blackish-fuscous; membranule brownish-black, the base white. 16—18 antecubitals; 6—8 postcubitals.

Length 70—74 millim. Alar expanse 105 millim. Pterostigma 5 millim.

Hab. Guatemala (Collection of Hagen); Venezuela (Appun); Pernambuco, Brazil (Veilenmann).

AESCHNA Fab.

Anal angle of the posterior wings of the male acute; second segment of the abdomen auriculated.

1. **Æ. sitchensis!**

Aeschna sitchensis Hagen!

Blackish-fuscous, spotted with blue; head?; thorax fuscous, sides with two oblique, obsolete, yellowish stripes; feet black, tibiæ exteriorly rufous; abdomen long, slender, equal, very much arcuated behind the inflated base; black, spotted with blue; segments 3—10 with two large, apical blue spots, 3 to 7, with two basal blue spots, the second segment with two blue lines each side; appendages black, moderate, a little incurved, foliaceous, the base narrow, within carinated, before the apex inflated, the apex short, acute, incurved; the inferior appendage one-half shorter,

elongately-triangular, obtuse; wings hyaline, pterostigma short, black; membranule black. Male. Fifteen antecubitals; nine postcubitals.

Length 58 millim. Alar expanse 78 millim. Pterostigma 4 millim.

Hab. Russian America, Sitka (Collection of Hagen).

It is very much like *Aeschna borealis* Zetterstedt, found in Northern Europe and Siberia.

2. Æ. septentrionalis!

Aeschna septentrionalis Burm! Handb. II, 839, 11.—*Aeschna minor* Ramb? Neuropt. 207, 20.

Blackish-brown, spotted with blue; head yellow in front; front anteriorly with a narrow, transverse line, a spot, large anteriorly, in the shape of a T, superiorly, and the rhinarium, black; labrum margined with black; thorax fuscous, dorsum each side with a point, sides with two, narrow, maculose stripes, yellow; feet black, above rufous; abdomen long, stoutish, narrowed behind the inflated base, black, spotted with blue; sides of the segments, two medial and two apical spots, blue; last segment of the male black, each side blue, an elevated tooth above; appendages brownish-black, moderate, a little incurved, foliaceous, the base narrow, a basal obtuse tubercle beneath; carinated inwards, before the apex inflated, the apex obtuse; the inferior appendage one-half shorter, elongately-triangular, obtuse; appendages of the female moderate, foliaceous, obtuse; wings hyaline, pterostigma fuscous, somewhat broad; membranule gray. 14—16 antecubitals; 11—12 postcubitals.

Length 54—55 millim. Alar expanse 74 millim. Pterostigma 4 millim.

Hab. Labrador; Nova Scotia.

Does *Aeschna minor* Rambur differ from it? the wings with a rufous spot at base. It is very much like *Aeschna sitchensis*, Hagen.

3. Æ. juncea!

Aeschna juncea Linne! Selys, Revue Odonat. Europ. 116, 3.—(With the synonyms.)

Fuscous, spotted with blue and yellow; head yellow, a narrow, transverse line in front, a T spot above, broader anteriorly, and the

rhinarium, black; thorax fuscous, dorsum each side with a narrow, short stripe, sometimes almost wanting and the sides with two oblique, broad stripes, yellow; feet black; abdomen long, slender, equal, very much narrowed behind the inflated base; brownish-black, with blue and yellow spots, segments 3—10 with two apical blue spots, 3—8 with two triangular spots upon the middle, yellow, apex of the second segment blue; last segment with the males, having an elevated, obtuse tooth above; appendages brownish-black, superior ones of the male, long, subrect, foliaceous, the base narrower, a carina inwardly, the base narrower, before the apex acuter, subincurved, inflated; the inferior appendage almost one-half shorter, elongately-triangular, obtuse; appendages of the female longer, foliaceous; wings hyaline, pterostigma narrow, fuscous; membranule brownish-cinereous, the base paler. 16 antecubitals; 7—9 postcubitals.

Length 66—75 millim. Alar expanse 92—100 millim. Pterostigma 4—5 millim.

Hab. Russian America; Kenai Island, Norton Sound.—Europe; Asia; Siberia; Kamtschatka; Ural.

4. Æ. multicolor!

Aeschna multicolor Hagen!

Fuscous, spotted with blue; head blue (♂) or luteous (♀), front with a T spot, each side terminated with yellow, and a band before the eyes, black; thorax fuscous, dorsum each side with a stripe, (interrupted or absent in the female), sides, each side with two oblique ones blue (♂) or yellow (♀); feet black, femora rufous above, the apex black, anterior femora beneath, luteous; abdomen moderate, slender, cylindrical, narrow behind the inflated base; fuscous, spotted with blue (♂) or yellow (♀), segments 3—10 with two large, apical spots, segments 3—8 with two triangular spots upon the middle, and a basal, divided spot each side, segment 2 with a medial, interrupted fascia, and a broad apical one, blue or yellow; superior appendages of the male black, long, foliaceous, narrow, the base narrower, inwardly carinated, straight, curved inwardly before the apex, an elevated, triangular lamina above, and a longer tooth placed more inferiorly, the apical tip acute, curved downwards; the inferior appendage, pale fuscous, one half shorter, elongately triangular; appendages of the female moderate, fuscous, foliaceous, broader; wings hyaline, those of the

female, towards the apex, subflavescent, pterostigma short, fuscous, or luteous (♀); membranule fuscous, the base white. 16—17 antecubitals; 8—9 postcubitals.

Length 65—67 millim. Alar expanse 90—100 millim. Pterostigma 3—3½ millim.

Hab. Pecos River, Western Texas (Capt. Pope); Upper Missouri; Mexico; Cordova (Saussure).

5. Æ. clepsydra!

Aeschna clepsydra Say. Journ. Acad. Philad. VIII, 12, 4.

Fuscous, spotted with blue; head luteous, an incurved, transverse line in front, a broad T spot above, terminated with blue and yellow, black; thorax fuscous, dorsum each side with a cuneiform, green stripe; each side with two broad, maculose and lacerated stripes, and an intermediate, abbreviated one, bluish-green; feet brownish-black, femora, tibiæ and the outside of the tarsi rufous; abdomen long, slender, equal, very much attenuated behind the inflated base; segments 3—10 with two larger, apical spots, 3—8 with two triangular, medial ones and each side a basal, divided one, segment 2 with a transverse, medial, interrupted fascia, and the apex, blue; the last segment with a small, basal tooth above, black, and blue spots confluent at the apex; appendages fuscous, margined with black, the superior ones long, narrow, straight, narrower at base, interiorly with a carina and clothed with hairs, the apex obtusely truncated, a small, acute, incurved tooth at the apex; before the apex are three teeth, superiorly at the internal margin; the inferior appendage one-third shorter, elongately triangular, acute; wings hyaline, pterostigma moderate, fuscous; membranule fuscous. Male. 16 antecubitals; 11 postcubitals.

Length 68 millim. Alar expanse 94 millim. Pterostigma 4 millim.

Hab. Massachusetts (Say); Boston (Scudder); Baltimore (Uhler).

6. Æ. verticalis!

Aeschna verticalis Hagen!

Fuscous, spotted with green and blue; head green, with a T spot above, and a band before the eyes, black; thorax fuscous, dorsum each side, with a cuneiform, green stripe; each side with

three oblique, yellowish-green stripes; feet black, femora and tibiæ above, rufous; abdomen long, slender, equal, very much narrowed behind the inflated base, fuscous, spotted with blue; spots like those of *Æ. clepsydra*, but not confluent on the last segment, with a small, basal tooth upon that segment; appendages similar to those of *Æ. clepsydra*, the tip of the apex acute, hardly incurved, above, before the apex, with an elevated line, no teeth; inferior appendage one half shorter, elongated, triangular, acuter; wings hyaline, pterostigma small, blackish-brown; membranule brownish-cinereous. Male. 17—20 antecubitals; 11—12 postcubitals.

Length 67 millim. Alar expanse 95 millim. Pterostigma 3 millim.

Hab. Washington (Osten Sacken); New York (Calverly).

7. Æ. hudsonica!

Aeschna hudsonica Selys' Collection.

Hab. Nova Scotia.

Similar to *Æ. juncea*, but only known to me by name.

8. Æ. constricta!

Aeschna constricta Say. Journ. Acad. Philad. VIII, 11, 3.

Brownish-black, spotted with green and blue; labrum yellow, head yellowish-green in front, a black T spot above; thorax fuscous, dorsum each side with a stripe, which is broader at the wings, the sides each with two oblique, green stripes; feet black, femora and tibiæ above, rufous; abdomen long, equal, blackish-fuscous, very much narrowed behind the inflated base; segments 3—10 with two, dorsal, apical, quadrangular, blue spots, 3—8 with two, medial, triangular, yellow spots, each side with a basal, divided, blue spot; second segment with a basal, dorsal, line, and each side with a transverse line upon the middle, yellow; the last segment flat above; appendages fuscous, superior ones long, subarcuated, the apex dilated, within carinated, before the apex tuberculous and inwards an acute, recurved tooth, extreme apex with a longer spine, which is acute and placed inferiorly; the inferior appendage one-half shorter, elongately triangular, obtuse; wings hyaline, pterostigma small, fuscous; membranule fuscous, the base white. Male. 17—21 antecubitals; 11—15 postcubitals.

Length 70 millim. Alar expanse 96—100 millim. Pterostigma 3 millim.

Hab. Indiana (Say); Maryland (Uhler); Wisconsin (Kennicott); St. Louis; Pennsylvania; Connecticut (Norton).

9. Æ. armata!

Æschna armata Hagen!

Brownish-black, spotted with blue; head in front obtuse, lurid, above with a T spot and band before the eyes, black; thorax fuscous, dorsum each side, anteriorly, with a yellowish-green spot; sides each with two oblique, yellowish stripes, of which the superior one is arcuated; femora above, in the middle, rufous; abdomen long, equal, narrowed behind the inflated base, black; segments 3—6 with two, blue, apical spots, and two larger, triangular, yellow ones, upon the middle, sides blue? second segment each side, with a line and a narrow, basal triangle, yellow, the last segments almost immaculate, the tenth segment, in the middle, above, with a long, compressed spine, bent backwards; appendages black, the superior ones long, foliaceous, straight, the base inwards narrowed, above carinated, the apex exteriorly obtuse, interiorly acute; before the apex superiorly, with an elevated, oval, dentate lamina; the inferior appendage one-half shorter, triangular, narrow, acute; wings subfumose, posterior ones of the female subflavescent at base, pterostigma very small, black; membranule fusco-cinereous, the base whitish. Twenty antecubitals; twelve postcubitals.

Length 68 millim. Alar expanse 92 millim. Pterostigma 2 millim.

Hab. Trogés del Oro, Mexico (Saussure, Deppe).

I have examined a mutilated male specimen.

10. Æ. mutata!

Æschna mutata Hagen!

Fuscous, spotted with yellowish-green; labrum luteous, black anteriorly; front green, above blue, with a T spot, terminated each side with yellow, and a band before the eyes, black; thorax fuscous, the sides each with two yellowish stripes; feet black, base of the femora rufous; abdomen long, equal, the base inflated, rufous, segments 3—9 with two apical, green? spots, which are margined within with black; segments 3—7 with two triangular, yellow,

medial spots; base and sides rufous, paler; appendages fuscous, foliaceous; wings hyaline, the base, anterior margin and middle flavescent; pterostigma longer, narrow, bright orange; membranule black, the base white. Female. Nineteen antecubitals; nine postcubitals.

Length 70 millim. Alar expanse 98 millim. Pterostigma 4 millim.

Hab. North America (Vienna Museum).

11. Æ. janata.

Æschna janata Say, Jour. Acad. Philad. VIII, 13, 6.

Fuscous, spotted with blue and yellow; front yellow, with a black T spot above; thorax fuscous, each side of dorsum with a blue stripe, sides each with two oblique, yellow stripes, which are margined with black; feet yellowish, beneath black; abdomen long, contracted behind the inflated base, fuscous, segments with a yellowish band at base, an interrupted apical one, and a spot in the middle, the last segment but little shorter than the preceding one, carinated at base; appendages subarcuated, near the base somewhat dilated, the apex broader, pediform, obtuse; inferior appendage hardly half as long as the superior ones; wings hyaline, extreme base fuscous, pterostigma fulvous; membranule white. Male. (From the description of Say.)

Length 60 ? millim.

Hab. Massachusetts.

Similar to *Æ. constricta*, but the last abdominal segment is longer, the apex of the appendages are mutic. It is entirely unknown to me.

12. Æ. florida!

Æschna florida Hagen!

Fuscous, spotted with green; front luteous, above green, immaculate, thorax fuscous, dorsum each side, with a very broad, green stripe; sides green, with an oblique, narrow, fuscous stripe; feet black, base of the femora rufous; abdomen longer than the wings, equal, the base inflated, the last segment shortest, fuscous, with a green ? dorsal, interrupted stripe, which is triangularly dilated at the apex of the segments, a lateral green ? stripe, and the ninth segment obsoletely bimaculated; appendages shorter than the last

segment, very small, black, flat, obtuse; wings subfumose, flavescent anteriorly, pterostigma narrow, fulvous; membranule fusco-cinereous. Female. Twenty antecubitals; twelve posteubitals.

Length 78 millim. Alar expanse 102 millim. Pterostigma 4 millim.

Hab. Mexico (Deppe).

It is most like *Æ. luteipennis* Burm., but distinct by the front, immaculate above, the stripes of the thorax being broader, not well terminated.

13. Æ. dominicana.

Æschna dominicana Selys' Collection.

Hab. St. Domingo. Unknown to me; similar to *Æ. juncea.*

14. Æ. contorta.

Æschna contorta Selys' Collection.

Hab. Nova Scotia. Unknown to me; similar to *Æ. cyanea.*

15. Æ. cyanifrons.

Æschna cyanifrons Selys' Collection.

Hab. Jamaica. Unknown to me; similar to *Æ. confusa.*

16. Æ. grandis!

Æschna grandis Linné. Selys, Revue Odonat. Eur. 131, 10 (with the synonymy).

Fuscous; head luteous, front with a spot above, anteriorly, fuscous; thorax fulvous, the sides each, with two oblique, yellow stripes, which are bounded with fuscous; feet fulvous; abdomen long, equal, behind the base inflated, then slightly narrowed, rufo-fuscous, with lateral, divided, blue spots; appendages fuscous, superior ones straight, foliaceous, carinated within, narrow at the base, at the apex obtuse; the inferior one-half shorter, triangular, obtuse; wings flavescent, pterostigma small, fulvous; membranule cinereous. 20—22 antecubitals; 12 posteubitals.

Length 70 millim. Alar expanse 94 millim. Pterostigma $3\frac{1}{2}$ millim.

Hab. Bergen Hill, New Jersey (Guex); I saw a single male. It is also common in Europe and Asia.

17. **Æ. adnexa!**

Æschna adnexa Hagen!

Fuscous, spotted with green; labrum pale, fuscous anteriorly; front anteriorly blue, above yellowish-green, with a broader T spot, and an ante-ocular band, black; thorax bright green, dorsum with a divided, middle fascia, and a lateral spot, the sides with two oblique streaks, all badly terminated, fuscous; feet black; abdomen a little narrowed at base, fuscous, the second segment with a medial and apical fascia, the third segment with a dorsal line, which is triangularly dilated upon the middle and apex, and the sides green? (the other segments are destroyed); wings hyaline, pterostigma moderate; brownish-black, membranule black. Male. 19 antecubitals; 10 postcubitals.

Length 60? millim. Alar expanse 87 millim. Pterostigma 4 millim.

Hab. Cuba (Poey).

Is it *Æ. cyanifrons* Selys? I have only examined a single mutilated specimen.

18. **Æ. virens!**

Aeschna virens Ramb. Neuropt. 193, 3.

Green, spotted with fuscous; labrum black anteriorly; head green, above with a T spot, and a narrow band before the eyes black; thorax bright green, sutures fuscous; feet black, anterior femora beneath yellowish; abdomen long, equal, a little narrowed behind the somewhat inflated base, green, spotted with fuscous, first segment green posteriorly, segments 2 to 8 green, with four fuscous, quadrangular spots, upon segments 2 to 4 they are smaller; segment 3 has the spots linear, basal; apical segments fuscous; appendages black, superior ones straight, foliaceous, obtuse; the inferior appendage one-half shorter, triangular, acute (of the female destroyed), wings hyaline, of the female, subflavescent posteriorly, pterostigma elongated, brownish-black; membranule brownish-gray. 20—24 antecubitals; 12—13 postcubitals.

Length 84 millim. Alar expanse 118 millim. Pterostigma 5—6 millim.

Hab. Cuba (Poey); St. Cruz de Bolivia (Rambur); Venezuela.

I have examined one female from the Island of Cuba; nor am I altogether certain, whether the male described from Venezuela

belongs here; it is extremely like it, by its few antecubitals, its long pterostigma, its obscure membranule, and its hyaline wings. I possess two females from Cuba (Poey), which are a little smaller; the bases of all the wings are flavescent; in all the rest they agree entirely with the description of *Æ. virens* Rambur.

19. Æ. ingens!

Aeschna ingens Ramb. Neuropt. 192, 1.

Green, spotted with fuscous; labrum black anteriorly; head green, above with a T spot, and fascia before the eyes, black; dorsum of the thorax fuscous, with a green stripe each side; sides green, with an oblique, narrow, fuscous stripe; feet black, anterior femora pale beneath; abdomen long, gradually narrowing posteriorly, that of ♂ hardly narrowed behind the base, fuscous, marked with green, the first segment green posteriorly, the second green, with a transverse, fuscous fascia at the apex, the following ones fuscous, with a dorsal, interrupted line, a middle fascia, triangularly dilated, an apical fascia, and the sides with a broader, interrupted fascia, green; the last segment fuscous, with two green spots; appendages fuscous; superior ones of the male long, foliaceous, straight, obtuse; the inferior one half as long, triangular, acute, those of the female extremely long, lanceolate, the base broader, before the apex slightly narrowed, subacute; wings hyaline, of the female flavescent at base, pterostigma long, fulvous; membranule gray. 20 antecubitals; 12 postcubitals.

Length 100 millim. Alar expanse 110—120 millim. Pterostigma 5 millim.

Hab. St. John's River, near Lake Harney, Florida (Osten Sacken; Norton); Cuba; United States (Selys).

20. Æ. heros!

Aeschna heros Fab. Entom. Syst. Suppl. 285.—Ramb.! Neuropt. 194, 4.—*Aeschna multicincta* Say, Journ. Acad. Philad. VIII, 9, 1.

Fuscous, marked with yellowish-green; front obscure luteous, above fuscous, each side with a yellowish-green spot; occiput of the female bifid; thorax fuscous, dorsum each side with a stripe, which is angulated at the wings, and the sides with two oblique stripes, green; feet black, base of the femora subrufous; abdomen long, stout, hardly broader at base, fuscous, the base, middle and

apex, of the segments, with a subinterrupted, narrow, green fascia; appendages black, subarcuated, the base narrower, a tubercle beneath, the apex carinated, truncated, inner edge villose; inferior appendage one-half the length of the superior, narrow, almost equal, the apex obtusely truncated, sometimes almost bifid; appendages of the female broad, ovate, foliaceous; wings hyaline, subflavescent in the middle, the apex sometimes infuscated, pterostigma long, narrow, fulvous; membranule white; twenty-five antecubitals; sixteen postcubitals.

Length 85—96 millim. Alar expanse 108—120 millim. Pterostigma 5—6 millim.

Hab. Indiana (Say); Massachusetts (Harris); New York (Calverly); N. Jersey (Guex); Maryland (Uhler); Tennessee (Saussure); Waterville; Mobile; Florida, Lake Harney (Osten Sacken); Louisiana (Schaum); Mexico (Rambur).

21. Æ. brevifrons!

Æschna brevifrons Hagen.

Fuscous, varied with blue; head luteous in front, varied with fuscous; front short, broad, above with a T spot in the middle, the root of which is triangularly dilated, black, surrounded with a yellow margin; thorax with the dorsum luteous, a short, fuscous streak each side; the sides blue, obscurely varied with white and black; feet yellow, beneath, knees, and the tarsi, black; abdomen inflated at base, nigro-fuscous, the segments with middle triangular spots and oval apical ones, blue; segment 2 has a transverse, medial, blue line, each side, bounded by black; segment 10 (♂) has the apex rounded, blue, a small, elevated tooth at base, and a black spot each side; superior appendages foliaceous, fuscous, narrower at base; the inferior one luteous, broad, triangular, a little shorter than the superiors; appendages of the female short, foliaceous, fuscous; wings hyaline, pterostigma short, fuscous; twelve antecubitals; ten postcubitals.

Length 67 millim. Alar expanse 91 millim. Pterostigma $2\frac{1}{2}$ millim.

Hab. Acapulco, Mexico; Valparaiso.

22. Æ. pentacantha!

Æschna pentacantha Ramb.! Neuropt. 208, 22.

Varied rufous and green; front produced; face yellow, subex-

cavated, the superior margin bounded by rufous; the front blue above, margined with yellow, the base rufo-fuscous; thorax villose, rufo-fuscous, dorsum each side with an arcuated stripe, sides each with two, green ones; feet black, femora partly rufous; abdomen long, sensibly narrowing posteriorly, rufo-fuscous, spotted with green (the markings obsolete); appendages black, superior ones short, narrow, before the apex dilated beneath, obliquely truncated; the inferior one a little shorter, narrow, triangular, obtuse; those of the female very small; wings hyaline, the apex subfumose, pterostigma narrow, yellow; membranule whitish; nineteen antecubitals; nineteen postcubitals.

Length 73 millim. Alar expanse 102 millim. Pterostigma $3\frac{1}{2}$ millim.

Hab. New Orleans (Schaum).

23. Æ. basalis.

Æschna basalis Selys' Collection.

Hab. Canada. Unknown to me.

24. Æ. quadriguttata!

Æschna quadriguttata Burm.! Handb. II, 837, 22.—Selys, Revue Odonat. Eur. 398. *Æschna vinosa* Say, Jour. Acad. Philad. VIII, 13, 5.

Fulvous; head fulvous, above with a fuscous stripe; thorax fulvous, the sides, each with two bright yellow spots, which are encircled with fuscous; feet luteous; abdomen long, equal, much narrowed behind the inflated base, fulvous, spotted with yellow (markings obsolete), segments with a yellow medial fascia, which is triangularly dilated; the apex yellow, with a trifid fuscous spot; appendages fulvous, the superior ones long, foliaceous, obtuse, the base narrower, and beneath with a small tooth; the inferior appendage very short, triangular, broader, obtuse; wings hyaline, with fulvous veins and a basal fulvous spot, the basal space reticulated, pterostigma small, yellow; membranule small, white; 19—20 antecubitals; nineteen postcubitals.

Length 60—65 millim. Alar expanse 85 millim. Pterostigma $3\frac{1}{2}$ millim.

Hab. Pennsylvania; Carolina; Massachusetts; Washington (Osten Sacken); Maryland (Uhler).

25. Æ. furcillata.

Æschna furcillata Say, Jour. Acad. Philad. VIII, 15, 7.—*Gynacantha quadrifida* Ramb.! Neuropt. 209, 1.

Varied green and fuscous; face yellowish, beneath obsoletely spotted, above with a somewhat T-shaped mark, which is dilated at base, black; thorax pubescent, green, dorsum rufo-fuscous, with two green stripes each side, the superior ones being transverse, and short; the sides with a fascia composed of three spots, black; abdomen long, cylindrical, inflated at the base, and then narrowed; varied with black and green, the basal spots larger; superior appendages long, foliaceous, subincurved, with a basal and medial tubercle beneath; the inferior appendage short, bifurcated, the branches diverging; wings hyaline, pterostigma short, broad, quadrangular; membranule sub-obscure. (♂. From the descriptions of Rambur and Say.)

Size of *Libellula ferruginea* Ramb.; but longer. Length 55? millim.

Hab. North America (collection of de Selys Longchamps); Massachusetts (Say).

GYNACANTHA Ramb.

Wings, with the anal angle of the posteriors, in the males, acute; second segment of the abdomen auriculated; last segment of the female spinous beneath.

1. Gyn. trifida!

Gynacantha trifida Ramb. Neuropt. 210, 3.—Selys, Poey Ins. Cuba, 459.

Fuscous, spotted with green; head obsoletely green in front, above with a T spot, black; thorax fuscous, dorsum each side with a cuneiform, green stripe; sides green, with two oblique, fuscous lines; feet rufo-fuscous, tarsi black; abdomen long, slender at the base, inflated, then narrowed fuscous, nearly all the segments with spots upon the middle, and two at apex, green; appendages fuscous, superior ones of the male, slender, the base narrow, cultriform, the apex acute, subaduncate, interiorly ciliated; the inferior one very short, triangular, obtuse; those of the female very long, foliaceous, towards the apex broader, obtuse; the last segment produced beneath, with three spines; wings hyaline, the base, in the

males, subflavescent, pterostigma moderate, fuscous; nineteen antecubitals; twelve postcubitals.

Length 60—70 millim. Alar expanse 84—90 millim. Pterostigma $3\frac{1}{2}$ millim.

Hab. Cuba (Poey); Jamaica; Brazil.

This species migrates in flocks during the early part of spring. (Poey.)

2. Gyn. septima.

Gynacantha septima Selys, Poey Ins. Cuba, 460.

Similar to the preceding, brownish-olive, the extremity of the front with a transverse, obsolete, fuscous spot; feet pale ferruginous; wings hyaline, or a little infuscated (adult); pterostigma rather short, fuscous; the male with a small, 4-toothed auricle (3-toothed in *Gyn. trifida*); appendages, superior ones long, slender, acute; the inferior one very short. (Male; from the description of De Selys Longchamps.) Of a little smaller size than *Gyn. trifida.*

Hab. Jamaica; Brazil.

Not sufficiently known to me.

Tribe III. LIBELLULINA.

Wings unequal; triangle of the anterior wings dissimilar; anterior genital hamule of the male free; penis and vesicle conjoined; genital organs of the female uncovered.

Sub-family V. CORDULINA.

Eyes with a tubercle in the middle, posteriorly.

MACROMIA Rambur.

Legs very long; tarsal unguiculi bifid, the branches equal.

1. M. taeniolata!

Macromia taeniolata Ramb. Neuropt. 139, 3.—*Macromia vittigera* Ramb. Neuropt. 140, 4.—*Macromia cincta* Ramb. Neuropt. 141, 5.

Obscure brassy-green; mouth luteous; front with a fascia anteriorly yellow, above excavated, brassy-green; thorax brassy-green,

dorsum each side, in front, with an abrupt yellow stripe, and the sides with an oblique, medial, yellow one; feet black; abdomen long, slender, brownish-black, segments 2—8 each side with a dorsal, yellow spot; appendages black, the superior ones cylindrical, with a small tooth outside; the apical half a little incurved, the apex acute; the inferior appendage equal, triangular, narrow; wings hyaline, pterostigma small, black; membranule cinereous. Male. The vulvar lamina is bilobed. (Female from the description of Rambur.) Twenty antecubitals; nine postcubitals; one discoidal areolet.

Length 85 millim. Alar expanse 110 millim. Pterostigma 4 millim.

Hab. Philadelphia; Maryland (Uhler).

2. M. cingulata.

Macromia cingulata Ramb. Neuropt. 137, 1.

Varied with black and yellow; mouth yellow; labium in the middle, and margin of the labrum black; front excavated and black superiorly; thorax violet-bluish, each side with three stripes, which are anteriorly abrupt, yellow; abdomen with yellow bands superiorly, which are narrowed; feet black; wings hyaline, a spot at base and the apex broadly flavescent; pterostigma small, rufo-fuscous. (Female from the description of Rambur.) Antecubitals — ? postcubitals — ? two discoidal areolets.

Length near 50 millim. Alar expanse near 85 millim.

Hab. North America.

3. M. annulata!

Macromia annulata Hagen!

Fuscous, varied with yellow; mouth and front yellow, front excavated above and yellow, with a median fuscous line; thorax fuscous, somewhat tinged with brassy-green, dorsum each side with a little abrupted fascia, and the sides each with two oblique stripes, yellow; feet black, base of the anterior femora yellow; abdomen long, slender, fuscous, segment 2 with a transverse fascia, segments 3 to 8 with a large, dorsal, quadrangular spot, yellow; appendages fuscous, yellowish at base; the superior ones cylindrical, with a tooth upon the external middle, the apical half subincurved, the apex obtuse; the inferior appendage yellowish, equal, triangular; the vulvar lamina short, excised; wings hyaline, the extreme base,

in the female, flavescent, pterostigma small, black; membranule whitish cinereous; 14—16 antecubitals; 8—9 postcubitals; two discoidal areolets.

Length 68—73 millim. Alar expanse 90—102 millim. Pterostigma $2\frac{1}{2}$ millim.

Hab. Pecos River, Western Texas (Capt. Pope).

4. **M. pacifica!**

Macromia pacifica Hagen!

Fuscous; thorax fuscous, tinged with brassy-green, dorsum each side with a stripe, and sides each with an oblique stripe, yellow; abdomen fuscous, spotted with yellow in part; feet black; abdominal appendages blackish-fuscous, the superior ones broader at base, a tooth upon the external middle; the basal half narrower, incurved, the apex acute, inferior appendage black, triangular, a little longer; wings hyaline, base of the posterior ones subfumose; pterostigma small, black; membranule whitish-cinereous. Male. Sixteen antecubitals; eleven postcubitals; two discoidal areolets.

Length —? millim. Alar expanse 86 millim. Pterostigma $2\frac{1}{2}$ millim.

Hab. North America, Pacific R. R. Survey, Lat. 38°.

The specimen is very much mutilated; I saw nothing but fragments, excepting the wings, feet, thorax, and abdomen.

EPITHECA Charp.

The triangles with transverse veins; hind wings of the male with the anal angle rounded; the accessory membranule large.

E. princeps!

Epitheca princeps Hagen!

Fuscous; mouth and front pale, labrum yellow; thorax luteous, dorsum anteriorly obsoletely fuscous, the sides at the feet a little varied with fuscous; feet luteo-fuscous, tibiae black, the anterior ones luteo-fuscous exteriorly; abdomen long, the base inflated, the apex equal, luteous, the dorsum obsoletely marked with fuscous; appendages long, fuscous, superior ones cylindrical at base, narrow, inflated at the apex, subincurved, obtuse; the inferior one luteous, shorter, triangular; vulvar lamina long, bilobed; wings hyaline, base of the anterior ones with a broad streak, a large,

triangular basal spot to the posterior ones, a large fenestrated, nodal spot, and the apices of all the wings brownish, pterostigma small, black; membranule large, white, the apex brownish-cinereous.

Var. The spots of the wings smaller, or almost wanting.

Eight antecubitals; 5—6 postcubitals; two discoidal areolets.

Length 63 millim. Alar expanse 88—93 millim. Pterostigma 3 millim.

Hab. Pecos River, Western Texas; Georgia (Abbot); Maryland.

A large specimen (♂) from Georgia, has 72 millims. length; alar expanse 102 millim., the fuscous spots of the wings are broader but it is hardly distinct.

DIDYMOPS Rambur.

Triangles with transverse veins; tarsal nails bifid, the branches equal.

1. D. transversa!

Libellula transversa Say, Journ. Acad. VIII, 19, 3.—*Epophthalmia cinnamomea* Burm. Handb. II, 845, 2.—*Didymops Servillii* Ramb.! Neuropt. 142, 1.

Rufo-fuscous, villous; front with a transverse, yellow fascia, above excavated, each side with a yellow spot; thorax rufo-fuscous, each side with an oblique, whitish stripe; abdomen stout, almost cylindrical, rufo-fuscous, the segments paler at base; appendages short, fuscous; vulvar lamina truncatedly-excised, short; feet rufous, tibiæ yellow exteriorly, tarsi black; wings hyaline, veins rufous, with a short, rufo-fuscous, basal, longitudinal spot, pterostigma small, fulvous; membranule white, the apex cinereous. (Female.)

Appendages of the male lanceolate, subarcuated, the apex exteriorly subdenticulated; the inferior appendage equal to the superiors. (From the description of Say.)

12—13 antecubitals; nine postcubitals; two discoidal areolets.

Length 55 millim. Alar expanse 75—80 millim. Pterostigma 2 millim.

Hab. Carolina (Zimmerman); Washington (Osten Sacken); Massachusetts (Say); Pennsylvania (Ziegler); New York (Asa Fitch).

2. D. obsoleta!

Libellula obsoleta Say, Journ. Acad. Philad. VIII, 28, 17.—*Libellula polystieta* Burm.! Handb. II, 856, 53.

Testaceous, hairy; mouth and front luteous; thorax testaceous, dorsum with a point each side, anteriorly, and the sides with a spot upon the middle, inferiorly, yellow; abdomen long, the base inflated, the apex depressed, broad, testaceous; appendages testaceous, the superior ones long, the base cylindrical, the apex broader outwardly, incurved, subacute; the inferior one a little shorter, triangular; wings hyaline, the second series of antecubital veins banded with yellow, the hind wings with a fulvous spot at base, pterostigma small, yellow; membranule white, the apex black. (Male.)

The female has the basal spot of the wings larger (Say.)

7—8 antecubitals; eight postcubitals; two discoidal areolets, then three following.

Length 43 millim. Alar expanse 62 millim. Pterostigma 2½ millim.

Hab. New Orleans; Indiana; Massachusetts (Say).

CORDULIA Leach.

Anal angle of the posterior wings of the male, acute (body brassy-green).

1. C. filosa!

Cordulia filosa Hagen!

Obscure brassy green; labium luteous, labrum and front fuscous; front above, and the vertex brassy-green; thorax brassy-green, the sides, each, with two, obsolete, yellow lines; feet black; abdomen long, slender, the base inflated, then becoming more slender, the apex a little broader, the second segment inferiorly, with a lateral, luteous spot; appendages black, the superior ones long, cylindrical, arcuated, before the apex thicker, the apex recurved outwards, the extreme apex unguiculated inside; the inferior appendage half the length of the superior ones, narrow, triangular; wings hyaline, pterostigma small, black; membranule large, fuscous, paler inwardly; anal angle of the posterior wings acute in the male. (♂.) Eight antecubitals; six postcubitals; two discoidal areolets.

Length 57 millim. Alar expanse 78 millim. Pterostigma 3 millim.

Hab. Georgia (Abbot).

2. **C. linearis!**

Cordulia linearis Hagen!

Obscure brassy-green; labium luteous; labrum and front fuscous, the front above, and the vertex brassy-green; thorax small, brassy-green, the sides fuscous, with a subæneous tinge; feet black, base of the anterior femora luteous; abdomen very long, slender, the base compressed, inflated, brownish-black, segments 2—8 with a basal, obsolete, yellow spot each side; appendages black, the superior ones short, the base cylindrical, arcuated, a small tooth externally, the apex dilated, acutely bifid, before the apex is another external tooth; the inferior appendage a little shorter, triangular, narrow; wings hyaline, pterostigma small, black; membranule large, fuscous, the base pale; anal angle of the male acute; nine antecubitals; 8—9 postcubitals; two discoidal areolets.

Length 60 millim. Alar expanse 92 millim. Pterostigma 3 millim.

Hab. St. Louis.

3. **C. tenebrosa.**

Libellula tenebrosa Say, Journ. Acad. Philad. VIII, 19, 4.

Obscure brassy-green; labium luteous; labrum and front fuscous; front brassy-green above; vertex fuscous; thorax brassy-green, each side with two lines, and a point posteriorly, yellow; abdomen obscure brassy-green, the base inflated, then very slender, behind the middle, fusiform; superior appendages arcuated, a tooth upon the middle superiorly, the apex abruptly incurved, truncated; feet black; wings hyaline, pterostigma black; membranule blackish, the base whitish; interior, anal margin of the posterior wings fulvo-fuscous. (From the description of Say.)

Length 51 millim. or larger.

Hab. Indiana.

4. **C. bifurcata.**

Cordulia bifurcata Selys' Collection.

Hab. Canada; Nova Scotia. Unknown to me.

5. **C. libera.**

Cordulia libera Selys' Collection.

Hab. Canada. Unknown to me.

6. C. procera.

Cordulia procera Selys' Collection.

Hab. North America. Unknown to me.

7. C. chalybea.

Cordulia chalybea Selys' Collection.

Hab. Nova Scotia. Unknown to me.

8. C. franklini.

Cordulia franklini Selys' Collection.

Hab. Hudson's Bay. Unknown to me.

9. C. richardsoni.

Cordulia richardsoni Selys' Collection.

Hab. Mackenzie River; Labrador. Unknown to me.

10. C. cingulata.

Cordulia cingulata Selys' Collection.

Hab. Newfoundland. Unknown to me.

11. C. tenebrica.

Cordulia tenebrica Selys' Collection.

Hab. Nova Scotia. Unknown to me.

12. C. saturata.

Cordulia saturata Selys' Collection.

Hab. Nova Scotia. Unknown to me.

13. C. albicincta!

Epophthalmia albicincta Burm.! Handb. II, 847, 8.

Brassy-green, hairy; labium luteous, front inferiorly and at sides, luteous, above and vertex brassy-green; thorax bright green-brassy; feet black; abdomen slender, at the base inflated, then slenderer, the apex equal, brassy-black, the base each side, and the last segment at the apex, luteous; appendages black, the superior ones short, depressed, straight, a basal tooth, and another upon the middle beneath, apex truncated, an internal unguiculus, which is arcuated, produced; inferior appendage triangular, a little shorter; vulvar lamina bilobed; wings hyaline, anterior

margin, in the females, subflavescent; pterostigma fulvous; membranule large, fuscous, whitish at the base; anal angle of the males subacute; 7—8 antecubitals; 7—8 postcubitals; two discoidal areolets.

Length 48 millim. Alar expanse 66 millim. Pterostigma 3 millim.

Hab. Labrador. Is it not *C. franklini?*

14. C. septentrionalis!

Cordulia septentrionalis Hagen!

Brassy-green, hairy; labium luteous; front brassy-green above, each side with a yellow spot; vertex brassy-green; thorax brassy-green, dorsum with a spot each side at the wings, and the sides each with two maculose stripes, yellow; feet black, anterior femora yellowish at base; abdomen slender, behind the base inflated, then attenuated, with the apex equal, brassy-black, the base each side, obsoletely luteous; the apex each side luteous, villose; appendages black, superior ones longer, subdepressed, straight, with a larger, basal tooth beneath, and a smaller one upon the external middle, internal, apical hook oblique, longer, the tip recurved; the inferior appendage half the length of the superiors, triangular; vulvar lamina bilobed; wings hyaline, the posterior ones with a small, basal, triangular, brownish-black spot, pterostigma small, fulvous; membranule large, fuscous, the base whitish; anal angle of the males subacute; seven antecubitals; seven postcubitals; two discoidal areolets.

Length 43 millim. Alar expanse 60 millim. Pterostigma $2\frac{1}{2}$ millim.

Hab. Labrador. Is it not *C. richardsoni?*

15. C. lateralis!

Epophthalmia lateralis Burm.! Handb. II, 847, 7. *Libellula cynosura* Say, Jour. Acad. Philad. VIII, 30, 19.

Fuscous; mouth and front luteous, above with an ante-ocular, narrow, black fascia; thorax luteo-fuscous, with gray hair, sides with an obsolete, yellow stripe; feet black, anterior femora almost entirely, and the base of the others luteous; abdomen depressed, a little broadened, the base inflated, compressed; brownish-black, each side with a marginal, maculose, yellow stripe; appendages black, superior ones long, cylindrical, obtuse, sub-arcuated, the

base narrow; inferior appendage shorter, triangular; vulvar lamina longly bifid; wings hyaline, posterior ones with a basal streak, and triangular basal spot, which is sometimes larger, blackish-fuscous, pterostigma luteous; membranule large, whitish-gray; anal angle of the males rounded; seven antecubitals; four postcubitals; two discoidal areolets.

Length 35—41 millim. Alar expanse 58 millim. Pterostigma 2 millim.

Hab. Massachusetts (Say); Philadelphia; Ohio; Louisiana; Florida (Osten Sacken).

Does it belong to this genus? Perhaps it is an *Epitheca.*

TETRAGONEURIA Selys.

Reticulation of the wings dense; anal angle of the posterior wings of the male, rounded.

1. T. semiaquea!

Libellula semiaquea Burm.! Handb. II, 849, 61. *Cordulia complanata* Ramb.! Neuropt. 145, 2, (in part.)

Fuscous; mouth and front luteous; thorax luteous, villose; the sides with an obsolete, yellow stripe; feet black, anterior femora luteous; abdomen broad, depressed, short, brownish-black, each side with a marginal, maculose, yellow stripe; appendages black, superior ones long, cylindrical, obtuse, the base narrow; inferior one triangular, a little shorter; vulvar lamina longly bifid; wings hyaline, basal half of the posteriors fuscous, subfenestrated; pterostigma small, luteous; membranule large, whitish; anal angle of the males rounded; six antecubitals; five postcubitals; two discoidal areolets.

Length 32—36 millim. Alar expanse 52—58 millim. Pterostigma 2 millim.

Hab. Savannah, Georgia; South Carolina.

2. T. balteata!

Tetragoneuria balteata Hagen!

Luteo-fuscous; mouth and front pale yellow; labrum with a basal point, and the front with a band at the eyes, fuscous; the large vertex and the occiput, pale yellow; thorax luteous, villose, the sides yellow, two obsolete stripes each side, and larger spots at

the base of the feet, blackish fuscous; feet black, base of the femora luteous; abdomen short, stout, triquetral, the base subinflated, luteous, the incisures and the three apical segments, black; appendages luteous; vulvar lamina short, subemarginate; wings hyaline, with luteous veins, the base with a fulvous spot, that of the anterior wings small, pterostigma yellow; membranule cinereous. (Female.) Six antecubitals; five postcubitals; two discoidal areolets.

Length 37 millim. Alar expanse 68 millim. Pterostigma 2½ millim.

Hab. Pecos River, Western Texas (Capt. Pope).

Does it belong to this genus?

3. **T. diffinis.**

Tetragoneuria diffinis Selys' Collection.

Hab. Nova Scotia. Unknown to me.

4. **T. costalis.**

Tetragoneuria costalis Selys' Collection.

Hab. Georgia. Unknown to me.

Sub-Fam. VI. LIBELLULINA.

Eyes entire behind; beginning of the second series of postcubital spaces with no transverse veins.

PANTALA Hagen.

Eyes connected in a long space; posterior lobe of the prothorax small, entire; abdomen cylindrical, stout, the apex sensibly attenuated, basal segments 2—4 with two transverse sutures; feet long, slender; base of the posterior wings triangularly dilated; pterostigma small, trapezoidal; first sector of the triangle of the anterior wings straight; triangles of the anterior wings narrow, long; caudal appendages elongated; genital organs of the male a little prominent, the anterior lamina bifid; internal branch of the hamule unguiculated; no unguiculus to the external one; vulva disclosed, the margin recurved, entire; the following segment carinated beneath, and bituberculated.

1. P. flavescens!

Libellula flavescens Fab.! Ent. Syst. Suppl. 285, 18–19; Selys! Poey, Ins. Cuba, 443.—*Libellula viridula* Beauv. Ins. Afr., et Amer. Neur. 69, pl. iii, fig. 4. Descript. de l'Egypte, Neuropt. pl. 1, fig. 4. Rambur! Neuropt. 38, 10.—*Libellula analis* Burm.! Handb. II, 852, 23. *Libellula terminalis* Burm.! Handb. II, 852, 24.—*Libellula sparshallii* Dale. Curtis, Guide. 162, 5. Selys, Monog. Libell. 36. Selys, Revue des Odonat. 322.

Testaceous-yellow; mouth, front and vertex pale; feet black, base of the femora, and the tibia exteriorly, yellowish; thorax with black spots inferiorly; abdomen with a dorsal, maculose, black stripe, which is often almost obsolete; appendages black, yellowish at base; wings hyaline, anal margin of the posterior ones flavescent, apices of all the wings sometimes a little fumose, pterostigma luteous; membranule white; fourteen antecubitals; seven postcubitals; three discoidal areolets.

Length 43—52 millim. Alar expanse 76—91 millim. Pterostigma 3 millim.

Hab. It encircles the whole world; no other species occupies so many countries. *America.* Georgia; St. Louis; Maryland (Uhler, rare and local); Cuba; Martinique; St. Thomas (*Lib. terminalis* Burm.); Venezuela; Surinam; Para, Brazil.

Asia. Banco; Sumatra (*Lib. flavescens* Fab.); Java (*Lib. analis* Burm.); Pondichery; Tranquebar; Bengal; Nicobar Islands; Ceylon; China; Japan; Luzon; Kamtschatka.

Oceanica. Oahu; Borabora; Tahiti; New South Wales.

Africa. Egypt; Senegambia; Sierra Leone; Angola; Owara; Congo (*Lib. viridula* Beauv.); Port Natal; Isle of France.

Europe? England, Horning (Dale); very likely an error.

2. P. hymenæa!

Libellula hymenæa Say, Jour. Acad. Philad. VIII, 19, 1.

Viridescent; mouth, front, and vertex yellowish; feet black, base of the femora, and the tibiæ exteriorly, yellowish; thorax each side, with two oblique, pale lines; abdomen with a maculose, dorsal stripe, which is obsolete anteriorly, and the sutures, black; appendages green; wings hyaline; anal margin of the posterior ones subflavescent, a round, fuscous spot, veined with yellow, before the anal angle; pterostigma yellowish; membrane white; fourteen

antecubitals; seven posteubitals; four discoidal areolets (only three at the triangle).

Length 47 millim. Alar expanse 88 millim. Pterostigma 4 millim.

Hab. Indiana (Say); Pecos River, Western Texas (Captain Pope); Matamoras, Mexico.

TRAMEA Hagen.

Eyes connected in a short space; posterior lobe of the prothorax small, entire; abdomen stout, cylindrical, slightly carinated; attenuated at the apex, segments 3 and 4 with transverse sutures; feet long, slender; base of the posterior wings triangularly dilated; pterostigma small, trapezoidal; first sector of the triangle of the anterior wings, almost straight; triangle long, narrow; caudal appendages very much elongated, slender; genital organs of the male a little prominent, anterior lamina recurved, entire, hamule cylindrical, the external branch elongated, no internal branch; vulvar lamina large, bifid, obtected, the segment following subcarinated beneath.

1. T. carolina!

Libellula carolina Linné, Centur. Insect. 28, 85; Amoen. Acad. VI, 441. Syst. Nat., ed. XII, 904, 17; ed. XIII, V, 2624, 17. Drury, Ins. I, 113, pl. xxxviii, fig. 1. Fab. Syst. Ent. 424, 23; Sp. Ins. I, 524, 30; Mantiss. Ins. I, 338, 33; Entom. Syst. II, 382, 41. Burm.! Handb. II, 852, 26. Say, Jour. Acad. Philad. VIII, 19, 2. Ramb.! Neuropt. 32, 1. Selys, Poey, Ins. Cuba. 440.

Rufo-fuscous; front superiorly, and vertex of the males brassy-purple; feet black, base of the femora rufous; abdomen sometimes pruinose, the three apical segments with a broad, dorsal, black band; superior appendages of the male black, the basal half rufous, as long as the two apical segments; the inferior appendage reaching beyond the denticulated portion of the superiors; hamule not exceeding the genital lobe; vulvar lamina shorter than the segment upon which it lies, excised within; wings hyaline; base of the anterior ones hardly yellow, posterior ones with the basal third fuscous, veined with yellow, the middle of the anal margin having a hyaline spot; pterostigma small, fuscous; membranule

white; twelve antecubitals; seven postcubitals; four discoidal areolets.

Length 52 millim. Alar expanse 90 millim. Pterostigma 3 millim.

Hab. Carolina; New Jersey; Georgia; Florida; Cuba; Guadeloupe; St. Thomas; the specimens from the Antilles which I saw were very much mutilated; they may perhaps belong to *T. onusta*.

2. T. chinensis!

Libellula chinensis De Geer, Mém. III, 556; pl. XXVI, fig. 1. Burm. Handb. II, 852, 27. *Libellula virginia* Ramb.! Neuropt. 33, 2.

Rufo-fuscous; front above, and the apex of the vertex, brassy-purple; feet black; abdomen having the three apical segments with a dorsal, broad, black band; superior appendages of the male black, as long as the three apical segments; inferior appendage short, acute, reaching beyond the denticulated portion of the superiors; hamule longly exceeding the genital lobe; vulvar lamina shorter than the segment upon which it lies, excised within; wings hyaline, the superior ones yellow at base; basal fourth of the posterior ones fuscous, veined with yellow, not attaining the anterior margin, surrounded with yellow; the anal margin with a large yellowish hyaline spot upon the middle; pterostigma small, fuscous; membranule white; twelve antecubitals; nine postcubitals; four discoidal areolets.

Length 53 millim. Alar expanse 104 millim. Pterostigma 3 millim.

Hab. China (De Geer); Madras (Burm.); Carolina (Vienna Museum); Virginia (Rambur).

3. T. onusta!

Tramea onusta Hagen.

Very much like *T. carolina*, but smaller; differs, in having front and vertex hardly obscurer; the superior appendages of the male a little longer; the inferior appendage just reaching to the denticulated portion of the superiors, the hamule long, exceeding the genital lobe; the vulvar lamina of the same length as the segment upon which it lies; base of the posterior wings less dilated, the basal, fuscous spot smaller, not attaining to the anterior margin of the wing, divided in front, and irregular exteriorly, the anal margin

with a large, hyaline spot; the pterostigma longer; twelve antecubitals; nine postcubitals; four discoidal areolets.

Length 43—47 millim. Alar expanse 78—90 millim. Pterostigma 3 millim.

Hab. Pecos River, Western Texas (Capt. Pope); Matamoras, Mexico.

I possess males with the fuscous spot of the wings almost like that of *T. carolina*, but they are not a different species.

I have a female from North America? very much mutilated, without head or abdomen, of the size of *T. onusta*, but the wings are narrower, the basal spot of the wings small and entire. Perhaps it is a different species.

4. T. lacerata!

Tramea lacerata Hagen!

Brownish-black; labrum black (♂), or margined with black (♀); face lurid, front superiorly shining violet, vertex shining violet (♂), or yellow in front (♀); thorax with a violet tinge; base of the abdomen sometimes pruinose, the seventh segment above with a quadrangular, yellowish-green spot (♂), or with double lines upon segments 2 to 5, replaced upon segments 6 and 7 by a large, quadrangular, posteriorly narrowed spot, yellowish-green; feet black; superior appendages very long, slender; hamule short, not reaching as far as the genital lobe; vulvar lamina half the length of the segment upon which it lies, excised within and at the apex; anterior wings with two fuscous, basal spots, posterior wings with a broad, basal, fuscous band, which is ragged exteriorly, and very deeply emarginated interiorly; pterostigma long, brownish-black; membranule snow-white; ten antecubitals; nine postcubitals; four discoidal areolets.

Length 44—49 millim. Alar expanse 84—94 millim. Pterostigma 4 millim.

Hab. Pecos River, Western Texas (Capt. Pope); Matamoras, Mexico; Maryland (Uhler).

5. T. abdominalis!

Libellula abdominalis Ramb.! Neuropt. 37, 8.—*Libellula basalis* Selys! Poey, Ins. Cuba, 441.

Rufo-fuscous, front and vert rufo-fuscous; feet black; three apical segments of the abdomen with a black, dorsal fascia; supe-

rior appendages of the male fuscous, rufous at base, as long as the two apical segments; the inferior appendage extending a little farther than the denticulated portion of the superiors; hamule exceeding the genital lobe; vulvar lamina as long as the segment upon which it is placed, excised; posterior wings with a narrow fuscous band, veined with yellow, not attaining the anterior margin; the anal margin with a very small hyaline spot; pterostigma short, brownish-black; membranule white; twelve antecubitals; ten postcubitals; four discoidal areolets.

Length 46 millim. Alar expanse 86 millim. Pterostigma 2½ millim.

Hab. Mexico; Guadeloupe; Cuba (Poey).

6. T. insularis!

Tramea insularis Hagen!

Rufo-fuscous; middle of the labrum, front above, and the apex of the vertex, brassy-purple; feet black, base of the femora rufous; the two anteapical segments of the abdomen above with a black band; superior appendages of the male long, rufo-fuscous, the base rufous, as long as the three apical segments of the abdomen; inferior appendage short, reaching a little beyond the denticulated portion of the superiors; hamule shorter than the genital lobe; vulvar lamina of the length of the segment upon which it lies, excised, rounded at the apex; wings partly veined with rufous, the posterior ones with a narrow, fuscous band at base, which is veined with yellow, and does not attain to the anterior margin; the anal margin with an oblong, hyaline spot; pterostigma short, fulvous; membranule white; twelve antecubitals; nine postcubitals; four discoidal areolets.

Length 45 millim. Alar expanse 80 millim. Pterostigma 3 millim.

Hab. Cuba (Poey).

7. T. simplex!

Libellula simplex Ramb. Neuropt. 121, 128. Selys, Poey Ins. Cuba, 452.

Rufo-fuscous; front and vertex brassy-purple; thorax pruinose above (adult male), the sides obscurely marked with black; feet nigro-fuscous, base of the femora rufescent; three apical segments of the abdomen above with a black band; superior appendages

of the male hardly as long as the two apical segments of the abdomen, black, the base hardly rufous; the inferior appendage extending beyond the denticulated portion of the superiors; hamule shorter than the genital lobe; vulvar lamina extremely short, excised; wings with rufous veins, the posterior ones with a narrow, fuscous, anal band, veined with yellow, not attaining to the front margin, the anal margin with an oblong, hyaline spot; pterostigma short, nigro-fuscous; membranule white; 8—10 antecubitals; 7—8 postcubitals; two discoidal areolets.

Length 38 millim. Alar expanse 70 millim. Pterostigma 2 millim.

Hab. Cuba (Poey); Tampico, Mexico (Saussure).

The specimen described by Rambur is smaller, and may be distinct. *Lib. marcella* Selys l. c. from Brazil, is of the same size as the specimens described by me; perhaps the same species.

CELITHEMIS Hagen.

Eyes connected in a short space; posterior lobe of the prothorax broad, excised in the middle; abdomen shorter than the wings, slender, compressed, trigonal, the base a little thicker, segments 2 and 3 with transverse sutures; feet long, slender; base of the posterior wings a little dilated; pterostigma oblong, long; the first sector of the triangle sinuated; triangle broad; caudal appendages short; genital organs of the male hardly prominent; hamule two-parted; vulva disclosed, the segment following it carinated beneath, bituberculated.

1. C. eponina!

Libellula eponina Drury, Ins. II, 86; pl. xlvii, fig. 2. Fab. Ent. Syst. II, 382, 39. Coquebert, Icon. 27, pl. vii, fig. 1. Burm. Handb. II, 853, 30. Ramb. Neuropt. 45, 20. Selys! Poey Ins. Cuba, 442. Oliv. Enc. Méth. VII, 572, 19. Say, Jour. Acad. Philad. VIII, 24, 11.—*Libellula camilla* Ramb.! Neuropt. 46, 21.—*Libellula lucilla* Ramb.! Neuropt. 46, 22.

Reddish-yellow; labium pale; thorax yellow, with a medial, fuscous stripe anteriorly; the sides with two lines, and a third, intermediate, abrupt one, brassy-black; feet black, base of the femora yellowish; abdomen yellow, dorsum each side with a

broad, longitudinal, black stripe, beneath pale; superior appendages of the male short, yellow; inferior one triangular, acute, a little shorter than the superiors; vulva uncovered, the margin recurved, excised in the middle; wings yellowish, veined with yellow; anterior ones with a basal spot, two bands and the apex, posterior ones with a basal double spot, two bands, the internal one mostly divided, and the apex, fusco-rufous; pterostigma fulvous or yellow; membranule white; ten antecubitals; nine postcubitals; five discoidal areolets, or an irregular number.

Length 40 millim. Alar expanse 74 millim. Pterostigma 4 millim.

Hab. Boston; Maryland (Uhler); New Jersey; Pennsylvania; Kentucky; Carolina; Indiana; Georgia; St. Louis; New Orleans; Pensacola; Cuba.

2. C. superba!

Celithemis superba Hagen!

Black; mouth and front black, front obsoletely yellow above; thorax black, dorsum scabrous, each side obsoletely marbled with yellow; feet black, exteriorly lineated with yellow; abdomen black, the middle segments each side with an oblique, obsolete, yellow line; appendages black; vulvar lamina erect, triangular, excavated, acute; wings hyaline, a broad, fenestrated, middle band, the apical margin narrowly, dentated posteriorly, fuscous; antecubital veins of the second space marked with fuscous, triangles with a fuscous spot, which is smaller upon the anterior wings, and the posterior wings with a basal, fuscous spot at the hind margin; pterostigma large, fuscous, the exterior half white, surrounded with fuscous; membranule white; ten antecubitals; six postcubitals; 3—4 discoidal areolets, at the triangle 4 or 5.

Length 34—37 millim. Alar expanse 62—66 millim. Pterostigma $4\frac{1}{2}$ millim.

Hab. Oaxaca, Mexico (Collection of Sommer); a male from Tampico (Saussure).

The fuscous bands and spots are broader in the male. A peculiar and most beautiful species; it differs from *C. eponina*, in having the posterior lobe of the prothorax small, rounded, the triangle narrow, the base of the hind wings not dilated.

PLATHEMIS Hagen.

Eyes connected in a short space; posterior lobe of the prothorax small, entire; the abdomen short, broad, depressed; the legs stout, short; pterostigma long, oblong; the first sector of the triangle sinuated; the triangle narrow, long; caudal appendages short; genital organs of the male rather prominent; the first abdominal segment, beneath, with a large, prominent fork; vulva disclosed, the segment following it excavated in the middle, bituberculated; the eighth segment in the female dilated at the sides.

1. P. trimaculata!

Libellula trimaculata De Geer, Mém. III, 556, 2; pl. xxvi, fig. 23. Fab. Ent. Syst. II, 374, 5. Burm.! Handb. II, 861, 78. Ramb.! Neuropt. 52, 28.—*Libellula lydia* Drury, Ins. I, 112; pl. xlvii, fig. 4. Say Jour. Acad. Philad. VIII, 20, 5. (Male.)

Rufescent; thorax each side with two oblique, yellowish stripes; abdomen of the male pruinose, female with lateral oblique, yellow spots, margined with fuscous; feet black, base of the femora rufescent; wings hyaline, a basal, longitudinal stripe, which is margined inferiorly with lacteous on the posterior wings, and a very broad band upon the middle (♂), or with the basal stripe, a spot upon the middle anteriorly, and the apex (♀), fuscous; pterostigma fuscous; membranule white; twelve antecubitals; nine postcubitals; four discoidal areolets.

Length 40 millim. Alar expanse 70 millim. Pterostigma 5 millim.

Hab. It is found from Maine to Florida, and from Texas to Minnesota; also in North California. A common species.

2. P. subornata!

Plathemis subornata Hagen!

Brownish-black, thorax with a stripe each side above, and the sides with two very oblique yellow stripes; feet black; abdomen with a broad, maculose stripe each side, on the dorsum and broader ones on the venter, yellow (in the male it is wanting towards the apex); wings hyaline, a basal, fenestrated streak, and two angulose bands, the one nodal, the other pterostigmatical, fuscous; ptero-

stigma narrow, fuscous; membranule white. The adult male has the bands of the wings joined together with fulvous; twelve antecubitals; nine postcubitals; four discoidal areolets.

Length 42 millim. Alar expanse 70 millim. Pterostigma 5 millim.

Hab. Pecos River, Western Texas (Capt. Pope).

"An adult male, in my collection (from the same locality), has the thoracic stripes wanting, and with merely yellowish spots at the origin of the anterior legs; the labium has a large, square, blue-black, middle band, and the labrum is entirely black, the upper part of the front is blackish. A similar, mutilated male, is in the Smithsonian Collection, labelled 'San Diego trip.'"—Uhler.

LIBELLULA Linné.

Eyes connected in a short space; posterior lobe of the prothorax small, entire; abdomen stout, rotundo-triquetral, sensibly narrowing posteriorly; feet long, stout; pterostigma oblong, large; the first sector of the triangle sinuated; triangle narrow, long; appendages short; genital organs of the male hardly prominent; vulva disclosed, the segment following it carinated in the middle and bituberculated.

1. L. quadrimaculata!

Libellula quadrimaculata Linné! Syst. Nat. ed. XII, 901, 1. Fab. Burm. Ramb. Selys, Revue des Odonat. 7, 2 (with synonomy).—*Libellula quadripunctata* Fab.! Entom. Syst. II, 375, 5.—*Libellula ternaria* Say, ♂ Jour. Acad. Philad. VIII, 21, 7.

Reddish-yellow, villose; front pale, above terminated with black; sides of the thorax yellowish, lineated with black; feet black; abdomen attenuated at the apex, fuscous behind, the sides yellow; superior appendages of the male black, very long; wings at base anteriorly, yellow, a costal spot and sometimes an apical one, the posterior wings with a triangular spot at base, reddish-black, veined with yellow; pterostigma brownish-black; membranule white; sixteen antecubitals; fourteen postcubitals; four discoidal areolets.

Length 48 millim. Alar expanse 80 millim. Pterostigma 4 millim.

Hab. Lake Michigan, Wisconsin. It migrates in immense flocks (Dr. Hoy); Canada; Massachusetts (Scudder); Europe; Asia; Siberia; Kamtschatka.

Common everywhere that it occurs. The male *L. ternaria* Say, from Massachusetts, certainly belongs to this species. The female of that species belongs to the following.

2. L. semifasciata!

Libellula semifasciata Burm.! Handb. II, 862, 80.—*Lib. maculata* Ramb.! Neuropt. 55, 31.—*Libellula ternaria* Say (♀), Journ. Acad. Philad. VIII, 21, 7.

Reddish-yellow, villose; front lurid, above terminated with black; sides of the thorax obliquely twice marked with yellow; feet black, femora yellowish rufous; apex of the abdomen attenuated, the dorsum with apical, triangular, fuscous spots, and lateral brighter yellow ones; superior appendages of the male short, blackish fuscous; base of the wings yellowish, a basal, longitudinal stripe, which is sometimes double upon the posteriors, an abrupt band upon the middle and a pterostigmatical band, sometimes also the apex fuscous; pterostigma large, rufo-fuscous; membranule white; fourteen antecubitals; ten postcubitals; four, or sometimes three discoidal areolets.

Length 37—45 millim. Alar expanse 66—77 millim. Pterostigma 5 millim.

Hab. New Jersey, Massachusetts, Maryland (Uhler); New York, Savannah, Georgia; Carolina, Florida (Osten Sacken).

3. L. nodisticta!

Libellula nodisticta Hagen!

Fulvous, clothed with white hair; front pale, brassy-fuscous above, terminated with black; dorsum of the thorax incanous, each side fuscous, sides pale with four sulphur spots; feet black, base of the femora fuscous; apex of the abdomen attenuated, fulvous, with a broad dorsal, black stripe; appendages short, black; wings hyaline, a basal fascia and a nodal point, black; pterostigma narrow, black; membranule white. Male.

Thirteen antecubitals; nine postcubitals; four discoidal areolets.

Length 47 millim. Alar expanse 77 millim. Pterostigma 4 millim.

Hab. Mexico (Saussure). It is allied to *Lib. quadrimaculata.*

4. L. saturata!

Libellula saturata Uhler, Proceed. Acad. Philad. 1857, 88, 4.

Reddish-yellow, villose; feet rufous; abdomen stout, the apex narrowed; wings hyaline, the anterior margin and basal half yellowish-rufous; a basal streak, especially to the posteriors, fusco-rufous; of the female hyaline, with the anterior margin flavescent; pterostigma small, fulvous; membranule black; twenty-one antecubitals; fifteen postcubitals; five discoidal areolets.

Length 52 millim. Alar expanse 90 millim. Pterostigma 5 millim.

Hab. California, "San Diego trip," Mexico (Collection of Hagen); Cordova; Tampico (Saussure).

5. L. luctuosa!

Libellula luctuosa Burm.! Handb. II, 861, 76.—*Libellula basalis* Say, Journ. Acad. Philad. VIII, 23, 10.

Brownish-black; front dark metallic blue (adult male); thorax with a dorsal yellow stripe, sides brown, marked with fuscous, or brownish-black, pruinose above (adult male); feet black, or with the femora rufo-fuscous (♀); abdomen brownish-black, dorsum and venter each side, with a broad yellow stripe, or brownish-black, pruinose above (adult male); appendages short, black; wings hyaline, the basal half blackish-fuscous, the apex sometimes clouded with fuscous, the middle band in the males broadly margined with milky-white; pterostigma black; membranule gray.

Var. Base of the anterior wings shortly or slightly blackish-fuscous, a basal streak blackish-fuscous. ♀.

15—19 antecubitals; 12—17 postcubitals; four discoidal areolets.

Length 38—45 millim. Alar expanse 73—84 millim. Pterostigma 4½ millim.

Hab. Pennsylvania; New Jersey; New York; Maryland (Uhler); Chicago; Washington (Osten Sacken).

6. L. odiosa!

Libellula odiosa Hagen!

Entirely brassy-black, or, excepting the front, medial thoracic vitta, and each side of the abdomen, which are yellow; base of the femora rufous (♀ teneral); wings hyaline, the basal half fus-

cous, the immediate base paler; female with the apex of the wings subinfuscated; pterostigma black; membranule gray; eighteen antecubitals; fourteen postcubitals; five or four discoidal areolets.

Length 47 millim. Alar expanse 85 millim. Pterostigma 5 millim.

Hab. Pecos River, Western Texas (Capt. Pope).

Similar to *Lib. luctuosa*, but the body is more robust, the spot at the base of the wings is clearer, or fenestrated. The wings of the female are also a little narrower.

7. L. julia!

Libellula julia Uhler! Proc. Acad. Philad. 1857, 88, 5.

Fuscous, villose; front lurid; thorax gray above, each side nigro-fuscous, the sides brown; feet black, base of the femora rufous; apex of the abdomen attenuated, apex of the dorsum fuscous, the sides with yellowish spots; appendages short, yellowish-rufous; wings hyaline, a small line at base, and a triangular spot behind the line at base, upon the posteriors, fuscous; pterostigma narrow, fuscous; membranule white. (Male.)

Fifteen antecubitals; twelve postcubitals; three discoidal areolets.

Length 42 millim. Alar expanse 72 millim. Pterostigma 3 millim.

Hab. Fort Steilacoom, Puget Sound, Washington Territory; Wisconsin (Dr. Hoy). This is the North American analogue of the European *Lib. fulva*, and belongs to the same group; the colors are defaced by alcohol.

8. L. pulchella!

Libellula pulchella Drury, Ins. I, 115; pl. xlviii, fig. 5. Ramb.! Neuropt. 54, 30. Duncan, Introduct. 292, pl. xxix, fig. 2.—*Libellula versicolor* Fab.! Ent. Syst. II, 380, 29 ♂; Syst. Ent. 423, 17; Sp. Ins. I, 523, 22; Mant. Ins. I, 337, 23.—*Libellula bifasciata* Fab.! Syst. Ent. 421, 3 ♀; Sp. Ins. I, 520, 3; Mant. Ins. I, 336, 3; Ent. Syst. II, 374, 4. Burm.! Handb. II, 862, 81; Blanch. Hist. Ins. 58, 9. Say, Journ. Acad. Philad. VIII, 20, 6.—*Libellula confusa* Uhler! Proc. Acad. Philad. 1857, 87, 3 (teneral).

Fuscous, villose; dorsum of the thorax grayish-fuscous, sides with two oblique yellow marks; abdomen stout, the apex attenuated, fuscous, each side with a yellow stripe, or pruinose (♂ adult); feet black, or with the base of the femora rufous (♀);

wings hyaline, a broad, basal, longitudinal stripe, an abrupt, medial band, and the apex, rufo-fuscous; the males with two alternate spots, and a spot at the anal angle of the posterior wings, milky-white; pterostigma large, black; membranule white; sixteen antecubitals; thirteen postcubitals; four discoidal areolets.

Length 48—52 millim. Alar expanse 86—90 millim. Pterostigma 6 millim.

Hab. New York; New Jersey; Philadelphia; Boston; Baltimore (Uhler); Texas; Mississippi (Edwards).

9. L. forensis!

Libellula forensis Hagen!

Rufo-fuscous, villose; front lurid, above brassy-black; dorsum of the thorax pruinose, the sides fuscous, each side binotated with yellow; feet black; abdomen stout, the apex attenuated, rufous, the base pruinose, the apex fuscous, sides spotted with yellow, venter fuscous, spotted with yellow; wings hyaline, a broad basal stripe, and a broad nodal band, rufo-fuscous; two alternating spots, and the anal part of the posteriors milky-white; pterostigma moderate, black; membranule white. Male.

Fourteen antecubitals; twelve postcubitals; four discoidal areolets.

Length 47 millim. Alar expanse 78 millim. Pterostigma 4 millim.

Hab. California (Berlin Museum).

10. L. deplanata!

Libellula deplanata Ramb.! Neuropt. 75, 61.—*Libellula exusta* Say, Jour. Acad. Philad. VIII, 29, 18.

Rufo-fuscous, villose; front luteous, vertex fuscous; the thorax rufous in front, with two yellow stripes, margined exteriorly with fuscous; feet fuscous; the abdomen short, triquetral, rufous, a dorsal stripe and the margins and sutures blackish-fuscous; wings hyaline, anterior ones with two lines at the base, posterior ones with a triangular spot at base, divided with yellow, rufo-fuscous; pterostigma small, fulvous; membranule whitish; twelve antecubitals; nine postcubitals; three discoidal areolets.

Length 32 millim. Alar expanse 56 millim. Pterostigma 3 millim.

Hab. Georgia; Massachusetts (Say). I am not quite sure whether it belongs to this genus.

L. exusta Say, differs in having twelve to thirteen postcubital cross-nervules; it may be a different species.

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(The females have the sides of the eighth abdominal segment dilated.) Species 11—17.

11. L. auripennis!

Libellula auripennis Burm.! Handb. II, 861, 77.—*Libellula costalis* Ramb.! Neuropt. 59, 36.

Reddish-yellow; thorax red, or with a middle, dorsal yellow stripe (teneral); feet reddish; abdomen long, slender, triquetral, reddish-yellow, a dorsal stripe, lost anteriorly, black; wings subfumose, veined with yellow; the anterior margin flavescent; the apex sometimes infuscated; pterostigma large, yellow or red; membranule black; 15—18 antecubitals; 11—15 postcubitals; four discoidal areolets.

Length 48—56 millim. Alar expanse 76—85 millim. Pterostigma 6 millim.

Hab. New Jersey (Guex); Maryland (Uhler); New York; Ohio; Savannah, Georgia; New Orleans, Louisiana; Florida (Osten Sacken).

12. L. incesta!

Libellula incesta Hagen!

Black, pruinose; labium luteous, front superiorly, brassy-black; sides of the thorax paler, pruinose, terminated inferiorly with black; feet black, base of the femora fuscous; abdomen long, slender, triquetral, black, pruinose; wings hyaline, veined with black, the apex hardly infuscated; pterostigma long, black; membranule cinereous. (Male.)

Fifteen antecubitals; twelve postcubitals; three discoidal areolets.

Length 54 millim. Alar expanse 84 millim. Pterostigma 6 millim.

Hab. Carolina (Zimmerman).

13. L. lydia!

Libellula lydia Drury, Ins. II, 85; pl. xlvii, fig. 1. Ramb.! Neuropt. 55, 32; Oliv. Enc. Méth. VII, 570, 8.—*Libellula leda* Say, Journ. Acad. Philad. VIII, 22, 8, var. A.

Reddish-yellow; front whitish; vertex, and labium in the mid-

dle, black; dorsum of the thorax rufous, the median sulcus yellow; the sides greenish-white, beneath terminated with black; abdomen long, narrow, triquetral, yellow, the base greenish-white, a dorsal stripe, and another each side at base, shorter, and the sutures, black; appendages black; feet black, base of the femora yellowish; wings hyaline, a short basal line, a nodal point, and the apex, blackish-fuscous; pterostigma large, black; membranule cinereous.

Adult Male. Thorax above, pruinose.

17—20 anteeubitals; 15—17 posteubitals; four discoidal areolets.

Length 58—61 millim. Alar expanse 100 millim. Pterostigma 7 millim.

Hab. New Orleans, Louisiana; Georgia; Virginia.

14. L. axillena!

Libellula axillena Westwood. Duncan, Introduct. 292, pl. xxix, fig. 1.—*Libellula lydia* Ramb.! Neuropt. 55, 32 (in part).—*Libellula leda* Say, Jour. Acad. Philad. VIII, 22, 8.

Similar to *Lib. lydia*, but differs from it by the male having the front and labrum black, carbonareous, front metallic-blue above; of the female, the labium and rhinarium black, the front reddish-yellow, above metallic-blue; tip of the vertex yellowish; feet black, the base of the femora hardly rufous; the dorsal stripe of the abdomen reaching to the thorax; a stripe upon the anterior margin of the wings, between the nodus and pterostigma, blackish-fuscous.

Length 50—60 millim. Alar expanse 80—92 millim. Pterostigma 6—7 millim.

Hab. Georgia; New Orleans, Louisiana; Florida (Osten Sacken).

Is it a variety of *L. lydia*?

15. L. flavida!

Libellula flavida Ramb.! Neuropt. 58, 35.

Reddish-yellow; mouth, front and tip of the vertex, pale yellow; thorax rufous anteriorly, the median sulcus yellowish; the sides yellowish-white, with an oblique fuscous stripe; abdomen long, triquetral, yellow; a dorsal stripe, another at base, each side, and the sutures, brownish-black; the inferior appendage pale; feet black, anterior femora yellowish beneath; wings hyaline, the ante-

rior margin flavescent, the base hardly rufescent, the apex subinfuscated; pterostigma large, bicolored, yellow, exteriorly fuscous; membranule gray.

Adult Male. Thorax and abdomen brownish-black, wings hardly flavescent anteriorly.

Fifteen antecubitals; eleven postcubitals; four discoidal areolets.

Length 48—52 millim. Alar expanse 84—88 millim. Pterostigma 6 millim.

Hab. Pecos River, Western Texas (Capt. Pope).

16. L. quadrupla!

Libellula quadrupla Say, Jour. Acad. Philad. VIII, 23, 9.—*Libellula bistigma* Uhler! Proc. Acad. Philad. 1857, 87, 1. Adult male.

Reddish-yellow; mouth and front yellowish, vertex fuscous; thorax anteriorly rufous, the median sulcus yellowish; sides pale yellow, with an interrupted, oblique, fuscous stripe; feet black, base of the femora luteous; abdomen triquetral, luteous, with a broad dorsal stripe, anteriorly absent, brownish-black; wings hyaline, the anterior margin, especially at the apex, flavescent, the base with a brownish-black streak; the apex sometimes infuscated; pterostigma large, broader in the middle, bicolored, yellow, exteriorly black; membranule black.

Adult Male. Thorax and abdomen nigro-fuscous, altogether pruinose, mouth, front, and the vertex black, wings sometimes hyaline anteriorly.

13—15 antecubitals; 9—11 postcubitals; three discoidal areolets.

Length 40—46 millim. Alar expanse 70—76 millim. Pterostigma 5 millim.

Hab. Baltimore (Uhler); Massachusetts; New Jersey; Maryland.

May this not be *Lib. cyanea* Fab.? (compare South American Neuroptera.)

17. L. plumbea!

Libellula plumbea Uhler! Proc. Acad. Philad. 1857, 87, 2.

Rufo-fuscous; mouth and front brassy-black, margined with yellow (♂), or luteo-fuscous (♀); vertex fuscous; thorax in front fuscous, pruinose (♂), or rufous, with the median sulcus yellowish (♀), sides yellowish-white, with an interrupted, oblique, fuscous

stripe; abdomen triquetral, fuscous, pruinose, beneath yellowish (♂), or rufous, a dorsal, brownish-black stripe, absent anteriorly (♀); feet black, femora partly rufescent; wings hyaline, the anterior margin entirely flavescent, a basal, not well terminated, fuscous streak, and the apex (in the female) also fuscous; pterostigma large, rufous; membranule whitish; sixteen antecubitals; twelve postcubitals; three discoidal areolets.

Length 46 millim. Alar expanse 74 millim. Pterostigma 6 millim.

Hab. Baltimore, Maryland; New Jersey (Uhler); Carolina.

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18. L. funerea!

Libellula funerea Hagen!

Male Adult. Black; mouth and front brassy-black; feet black, the four posterior tibiæ yellow exteriorly; abdomen slender, triquetral, black; the appendages yellow; wings blackish-fuscous; the apex, and base of the anterior ones hyaline; pterostigma large, black, membranule black. *Teneral male and the female* approaching a yellow color, the mouth and front yellowish; thorax yellow, the dorsum each side, infuscated; feet lurid; abdomen yellowish, the dorsum and sides subinfuscated; the wings somewhat yellowish, the apex hyaline, the apical margin infuscated; pterostigma pale; twelve antecubitals; ten postcubitals; three discoidal areolets.

Length 50 millim. Alar expanse 70 millim. Pterostigma 5 millim.

Hab. Mexico.

19. L. umbrata!

Libellula umbrata Linné, Syst. Nat. 903, 13; Fab. Syst. Ent. 422, 14; Sp. Ins. I, 522, 18; Mant. Ins. I, 337, 18; Ent. Syst. II, 378, 21; Burm. Handb. II, 856, 48. Ramb.! Neuropt. 73, 58. Selys! Poey, Ins. Cuba, 448.—*Libellula unifasciata* De Geer, Mém. III, 557, 3; pl. xxvi, fig. 4.—*Libellula fallax* Burm.! Handb. II, 855, 45 (teneral).—*Libellula subfaciata* Burm.! Handb. II, 855, 46 (male teneral).—*Libellula tripartita* Burm.! Handb. II, 856, 47 (male adult).—*Libellula ruralis* Burm.! Handb. II, 856, 49 (female).—*Libellula flavicans* Ramb.! Neuropt. 87, 79 (female).

Male teneral, and Female. Olivaceous, mouth and front flavescent; dorsum of the thorax obsoletely varied with fuscous; feet fuscous, femora partly yellowish; abdomen olivaceous, a dorsal stripe, almost absent anteriorly, and the apex of segments 4—10,

brownish-black; appendages yellowish; wings hyaline, the apex subfuscous, base of the posterior ones ochraceous; pterostigma large, fulvous; membranule fuscous.

Male Adult. Mouth and front steel-blue; body nigro-fuscous, with a violet tinge, pruinose; wings with a broad, blackish-fuscous band, between the nodus and pterostigma; pterostigma brownish-black, the base of the posterior ones rufo-fuscous; the apex of each, often hyaline; 11—13 antecubitals; 9—12 postcubitals; three discoidal areolets.

Length 38—47 millim. Alar expanse 56—72 millim. Pterostigma 4—5 millim.

Hab. Georgia (Abbot), a single male in Hagen's collection; Matamoras, Mexico, a single male in Hagen's collection; Cuba (Poey); Martinique; St. Thomas; Barbadoes; Porto Cabello, Venezuela; Surinam, Essequibo, Guiana; Bahia, Rio, Brazil; Buenos Ayres. An extremely common species in tropical South America.

20. L. angustipennis!

Libellula angustipennis Ramb. Neuropt. 63, 42; Selys, Poey Ins. Cuba, p. 446.

Yellowish-red; front pale, steel-blue above; thorax fuscous, dorsum with three lines, the sides with two stripes and two lines, yellow; abdomen triquetral, toward the apex narrower, fuscous, dorsum with three yellow streaks; the female has the eighth segment dilated at the sides; feet blackish-fuscous, the anterior femora yellowish beneath; wings hyaline, narrow, the apex subinfuscated; pterostigma long, fuscous; membranule cinereous; fifteen antecubitals; ten postcubitals; two discoidal areolets.

Length 40 millim. Alar expanse 68 millim. Pterostigma 4 millim.

Hab. Cuba (Poey). Does it belong to this genus?

21. L. vibex!

Libellula vibex Hagen!

Brownish-black; labium yellow, with a triangular spot in the middle; front yellowish, chalybeous above; thorax black, dorsum with a yellow stripe in the middle; sides with two stripes, and two lines, yellow; feet black, anterior femora yellowish beneath; abdomen triquetral, black, slender, almost equal, the base with a short,

dorsal stripe, and the sides obsoletely yellow; wings hyaline, narrow; pterostigma long, black; membranule blackish-gray. (Male.)

Fifteen antecubitals; ten postcubitals; two discoidal areolets.

Length 40 millim. Alar expanse 69 millim. Pterostigma 4 millim.

Hab. Cordova (Saussure).

It is most like *Libellula angustipennis*, but the posterior lobe of the prothorax is shorter, not rounded, and the external hamule is narrower, divided.

Subgenus **Orthemis** Hagen.

The first sector of the triangle straight; the abdomen broad, depressed; female having the sides of the eighth segment dilated; pterostigma large.

22. O. discolor!

Libellula discolor Burm.! Handb. II, 856, 51.—*Libellula macrostigma* Rambur! Neuropt. 57, 54. Selys! Poey, Ins. Cuba, 447.—*Libellula ferruginea* Fab. Syst. Entom. 423, 19. Sp. Ins. I, 523, 25. (Not of Entom. Systemat.)

Rufous or blue, pruinose (*adult male*), labium yellowish, fuscous in the middle; thorax with the dorsal sulcus yellow, each side with four yellow lines; feet rufous, the femora in part paler; abdomen rufous, a dorsal stripe, and each side at base yellowish; wings hyaline, the apex sometimes infuscated; pterostigma large, fuscous; membranule black.

Var. Thorax and abdomen with no yellow stripes.

16—19 antecubitals; 13—15 postcubitals; three discoidal areolets.

Length 48—55 millim. Alar expanse 70—95 millim. Pterostigma 7 millim.

Hab. Western Texas; Matamoras, Tampico, Mexico; Cuba; Martinique; San Domingo; Guadaloupe; St. Thomas; Porto Rico; St. Croix; Jamaica; Porto Cabello, Venezuela; Surinam, Guiana; Chili; Equador; Guayaquil; Rio, Minas Geraes, Bahia, Pernambuco, Brazil. A most common species.

LEPTHEMIS Hagen.

Eyes very slightly connected; posterior lobe of the prothorax large, bilobed; abdomen long, almost longer than the wings, nar-

row, slender, equal, triquetral, the base vesicle-like, compressed; feet long, stout; the first sector of the triangle sinuated; the triangle narrow, short; appendages short; male genital organs hardly prominent; the vulva obtected, the segment following it carinated in the middle, bituberculated; the sides of the eighth segment of the female entire.

1. Lep. vesiculosa!

Libellula vesiculosa Fab. Syst. Ent. 421, 7; Sp. Ins. I, 521, 9; Mant. Ins. I, 336, 9; Entom. Syst. II, 377, 12. Burm.! Handb. II, 857, 54. Ramb.! Neuropt. 50, 26. Selys! Poey, Ins. Cuba, 443. *Libellula acuta* Say, Jour. Acad. Philad. VIII, 24, 12.

Yellowish-green; head and thorax uniform in color; feet black; femora yellowish-green, lineated above and below with black; abdomen yellowish-green, the base immaculate, lineated and margined with black, segments 3 to 6 with quadrangular, apical, blackish-fuscous spots; appendages yellowish; wings narrow, hyaline, base of the posterior ones subochraceous; pterostigma long, yellowish; membranule black; sixteen antecubitals; twelve postcubitals; three discoidal areolets.

Length 53—63 millim. Alar expanse 74—90 millim. Pterostigma 5 millim.

Hab. Matamoras, Mexico; Cuba; St. Domingo; St. Thomas; Guiana; Bahia, Rio, Pernambuco, Brazil.

2. Lep. hæmatogastra!

Libellula hæmatogastra Burm.! Handb. II, 837, 55.

Red; labium yellowish, with a middle, black stripe; front brassy-fuscous (♂); feet black, the femora red within; abdomen red, or with the sutures and the apex of the segments fuscous (♀); appendages red; wings hyaline, the base of the posterior ones with a fuscous spot; pterostigma red; vulvar lamina triangular, recurved; 14—15 antecubitals; twelve postcubitals; three discoidal areolets.

Length 45—50 millim. Alar expanse 70—74 millim. Pterostigma $3\frac{1}{2}$—4 millim.

Hab. Georgia (Abbot; Zurich Museum); Surinam; Pernambuco, Brazil.

3. Lep. verbenata!

Lepthemis verbenata Hagen!

Luteous; mouth fuscous, sides of the labium pale; dorsum of the thorax luteous, each side fuscous; feet black, the femora partly luteous; abdomen luteous, the sutures and margins, the apex of segments 4 to 7, and 8—9 entirely fuscous; appendages luteous; vulvar lamina triangular, recurved; wings hyaline, the posterior ones with a basal, fulvous spot, which is veined with fuscous; pterostigma luteous; membranule black.

Male Adult. Entirely blackish-fuscous, appendages luteous; spot of the base of the posterior wings, blackish-fuscous.

12—14 antecubitals; 10—12 postcubitals; three discoidal areolets.

Length 43—48 millim. Alar expanse 66—74 millim. Pterostigma 4 millim.

Hab. Cuba (Poey); Porto Cabello, Venezuela; Surinam; Brazil.

DYTHEMIS Hagen.

Eyes connected in a short space; posterior lobe of the prothorax small, entire; abdomen a little shorter than the wings, slender, triquetral, the base a little inflated, compressed, the apex a little broadened; feet long, slender; the first sector of the triangle a little sinuated; the triangle moderate, narrow; appendages short; genital organs a little prominent; vulva disclosed, the lamina emarginated, the segment following it carinated, bituberculated; sides of the eighth segment of the female entire.

1. D. rufinervis!

Libellula rufinervis Burm.! Handb. II, 815, 15.—*Libellula conjuncta* Ramb.! Neuropt. 91, 84. Selys! Poey, Ins. Cuba, 444.

Reddish-yellow; mouth and front yellowish-red; dorsum of the thorax rufo-fuscous, or each side with an obsolete yellow line (♀); sides yellowish, four-striped with black; feet black, or with the femora partly luteous (♀); abdomen slender, reddish-yellow, the incisures, a basal and lateral stripe, and a dorsal streak each side upon segments 8 and 9, black; appendages rufous; wings hyaline, with red veins, the base yellowish, base of the posterior wings with two fuscous streaks; pterostigma rufo-fuscous; membranule

black; fifteen antecubitals; 8—10 postcubitals; three discoidal areolets.

Length 39 millim. Alar expanse 65 millim. Pterostigma 3 millim.

Hab. St. Domingo, Port au Prince; Cuba (Poey).

2. D. velox!

Dythemis velox Hagen!

Brownish-black; labium and front yellowish-green; thorax fuscous, subaeneous, the dorsum with a middle line, a lateral one each side, and a transverse one before the wings, yellow; sides yellow, with four fuscous stripes; feet black, anterior femora yellow beneath; abdomen slender, the apex thicker, brownish-black, dorsum of segments 1—7 each side with a greenish-yellow spot, that of the seventh segment larger, those of the basal segments double, the third segment each side yellowish-green; appendages black; wings hyaline, the extreme base rufo-fuscous, the apex fuscous; the pterostigma black; membranule black; 14—16 antecubitals; 9—10 postcubitals; three discoidal areolets.

Length 44 millim. Alar expanse 70 millim. Pterostigma 4 millim.

Hab. Pecos River, Western Texas (Capt. Pope).

3. D. fugax!

Dythemis fugax Hagen!

Brownish-black; mouth and front luteous; thorax fuscous, or the dorsum having each side a broader stripe, and transverse streak before the wings, yellowish-green; sides yellowish-green, with four black stripes; feet black; abdomen slender, the apex stouter, nigro-fuscous, dorsum of the second segment with a trilobed spot, segments 3 to 6 with a double spot each side, and the seventh with a larger spot each side, greenish-white; segments 1—7 with a greenish-white spot each side, laterally; appendages black; wings hyaline, the extreme apex sometimes infuscated, the base with a large, fulvous spot, fenestrated with fuscous, and including two basal, brassy-fuscous streaks, upon all the wings; pterostigma black; membranule whitish-gray; 13—15 antecubitals; 8—9 postcubitals; three discoidal areolets.

Length 45 millim. Alar expanse 76 millim. Pterostigma 4 millim.

Hab. Pecos River, Western Texas (Capt. Pope).

4. D. mendax!

Dythemis mendax Hagen!

Blackish-fuscous; mouth and front pale yellow; thorax fuscous, dorsum each side with a fascia, which is broader at the wings, angulose, greenish-white; sides greenish-white, with two oblique, approximate, fuscous stripes; feet black; the anterior femora pale beneath, abdomen slender, a little longer than the wings, the base compressed, more inflated, the apex stouter; brownish-black, segments 1—7 with a double spot each side upon the dorsum, greenish-white, upon segments 4—6 it is almost linear, upon segment 7 posteriorly, a large dilated spot, the sides and venter spotted with greenish-white; appendages black; wings hyaline, the posterior ones fulvous at the extreme base; pterostigma small, black; membranule black; twelve antecubitals; eight postcubitals; two discoidal areolets.

Length 55—60 millim. Alar expanse 76—86 millim. Pterostigma 3 to $3\frac{1}{2}$ millim.

Hab. Pecos River, Western Texas (Capt. Pope).

I saw a female from Tampico (Saussure) which had the head chalybeous above: is it different?

5. D. praecox!

Dythemis praecox Hagen!

Fuscous; mouth pale, the front fusco-aeneous above; dorsum of the thorax fuscous, a green stripe each side, which is broader at the wings, angulose; the sides fuscous, three stripes, the middle one interrupted, green; feet black, the femora luteous in part; abdomen slender, a little longer than the wings, the base compressed, more inflated, the apex thicker; fuscous, dorsum each side upon segments 1—7, with a double, yellowish spot; upon segments 4—6 the spots almost linear; upon segment seven a larger, broader spot posteriorly; appendages black; wings fusco-fumose, fulvous at base; pterostigma small, black; membranule black. Female.

Twelve antecubitals; seven postcubitals; two discoidal areolets.

Length 48 millim. Alar expanse 70 millim. Pterostigma $2\frac{1}{2}$ millim.

Hab. Mexico (Collection of Hagen).

6. D. frontalis!

Libellula frontalis Burm.! Handb. II, 857, 56; Selys! Poey, Ins. Cuba, 453.

Black, pruinose; front white, above greenish-chalybeous; thorax pruinose, the dorsum with a yellowish spot each side, which is not very clear; feet black, anterior femora pale inside; abdomen slender, a little shorter than the wings, black, segments 7 to 9 dilatedly ovate; appendages black; wings hyaline; pterostigma black; membranule black; fifteen antecubitals; postcubitals — ? three discoidal areolets.

Length 44 millim. Alar expanse 73 millim. Pterostigma $2\frac{1}{2}$ millim.

Hab. St. Domingo; Cuba (Collection of De Selys Longchamps).

7. D. pleurosticta!

Libellula pleurosticta Burm.! Handb. II, 849, 3.—*Libellula celaeno* Selys! Poey, Ins. Cuba, 454.

Brownish-black; front whitish, chalybeous above; thorax nigro-fuscous, dorsum with a stripe each side, which is larger at the wings, angulose, and an intermediate line, greenish-white; sides black, each with three larger spots and two smaller ones, greenish-white; feet blackish-brown; abdomen of the length of the wings, slender, almost equal, black, segments 1—8 (or 9 ♀) marked upon the dorsum with a double, linear, greenish-white spot; appendages black; wings hyaline, a basal small streak, almost absent in the males, fuscous; base of the posterior wings a little fulvous; pterostigma black; membranule cinereous; fourteen antecubitals; 8—10 postcubitals; two discoidal areolets.

Length 43 millim. Alar expanse 59—64 millim. Pterostigma 2 millim.

Hab. Cuba; St. Domingo; St. Thomas; Brazil.

8. D. didyma!

Libellula didyma Selys. Poey, Ins. Cuba, 453.—*Libellula phryne* Ramb. Neuropt. 121, 27.

Brownish-black; mouth and front yellowish, front chalybeous above; thorax nigro-fuscous, dorsum each side, with an oblique line, the intermediate sulcus, and a transverse line at the wings, greenish-yellow; sides greenish-yellow, with three brassy-brown stripes; feet black, the anterior femora interiorly partly pale; the abdomen a little shorter than the wings, slender, broader before

the apex, black, segments 1—6 with a linear, yellowish spot each side, the base of the seventh with a larger, twin-spot, greenish-yellow; appendages black; hamules not prominent; wings hyaline, the extreme base fulvous; pterostigma oblong, blackish-brown; membranule black.

The female varies by having the abdominal spots larger.

9—11 antecubitals; seven postcubitals; two discoidal areolets.

Length 33—35 millim. Alar expanse 57 millim. Pterostigma $2\frac{1}{2}$ millim.

Hab. Cuba (Poey); Matamoras, Mexico; Tampico (Saussure).

The Mexican specimens are larger, and the stripes and spots are larger; perhaps they constitute a distinct species.

9. D. dicrota!

Dythemis dicrota Hagen!

Brownish-black; mouth and front yellowish, front chalybeous above; thorax black, dorsum each side with an oblique line, the intermediate sulcus and a transverse line at the wings, yellowish-green; sides greenish-yellow with two brassy-fuscous stripes; feet black, the anterior femora beneath partly yellowish; abdomen a little shorter than the wings, slender, broader before the apex, black, segments 1—6 with a linear spot each side, the seventh segment with a larger, basal yellowish twin-spot; appendages black; hamules prominent, large, recurved; wings hyaline, the extreme base fulvous; pterostigma oblong, fuscous, membranule black; ten antecubitals; seven postcubitals; two discoidal areolets.

Length 33—36 millim. Alar expanse 53—57 millim. Pterostigma 3 millim.

Hab. Cuba (Poey).

10. D. pertinax!

Dythemis pertinax Hagen!

Nigro-fuscous; mouth and front pale yellow; middle of the labium black; front above and vertex chalybeous; thorax blackish-fuscous, the dorsum each side with a stripe, which is broader at the wings, angulose, green; the sides nigro-fuscous, with two oblique, green stripes; feet black, anterior femora at the base beneath rufous; abdomen slender, a little longer than the wings, the base compressed, more inflated, the apex a little stouter;

black, the base each side with a maculose, green stripe, dorsum of the seventh segment each side, with a lanceolate, long, green spot; appendages black; wings hyaline, the anterior margin at base subflavescent; pterostigma small, black; membranule black. Male.

Fifteen antecubitals; ten postcubitals; two discoidal areolets.

Length 54 millim. Alar expanse 86 millim. Pterostigma 2 millim.

Hab. Mexico (Vienna Museum).

Similar to *Libellula nubecula* Rambur, but certainly distinct.

11. D. aequalis!

Dythemis aequalis Hagen!

Fuscous; mouth and front whitish-yellow; the vertex, and the front above, chalybeous; thorax brassy-fuscous, the dorsum each side with an oblique streak, middle sulcus, and a transverse line at the wings, yellow; the sides brassy-fuscous, with three broad, irregular, yellow stripes; feet black, the extreme base fuscous; abdomen shorter than the wings, slender, broader before the apex, triquetral, brassy-fuscous, the base each side with a maculose stripe, and the seventh segment each side with a large, cuneiform, yellow spot; appendages black; anterior genital lamina each side with a large, prominent auricle; the hamule not prominent; vulvar lamina large, oval; wings hyaline; pterostigma oblong, black; membranule black.

Adult Male. Thorax and base of abdomen pruinose.

Female. Abdomen each side, with a broad, interrupted, yellow stripe.

Eight antecubitals; six postcubitals; two discoidal areolets.

Length 28 millim. Alar expanse 46 millim. Pterostigma 2 millim.

Hab. Cuba (Poey); Matamoras, Mexico.

12. D. naeva!

Dythemis naeva Hagen!

Brownish-black; mouth and front black, with two yellow spots each side; front superiorly and the vertex, chalybeous; thorax black, subpruinose, a little clothed with cinereous hair; sides each with oblique stripes, which are obsolete above, yellow; feet black; abdomen shorter than the wings, slender, triquetral, hardly thicker

before the apex, black, subpruinose, segments 2—7 each side with a larger yellowish spot, which is obsolete in the female; appendages black; anterior lamina entire; hamules prominent, black, furcated, the external branch large, truncated; vulvar lamina large, erect, triangular, excavated; wings hyaline; pterostigma oblong, fuscous; membranule black; 7—10 antecubitals; 6—7 postcubitals; two discoidal areolets.

Length 30 millim. Alar expanse 48 millim. Pterostigma $2\frac{1}{3}$ millim.

Hab. Cuba (Poey).

13. D. debilis!

Dythemis debilis Hagen!

Nigro-fuscous; mouth and front yellowish-white; vertex, and the front above, chalybeous; thorax nigro-fuscous, clothed with cinereous hair, pruinose; the sides brassy-fuscous, obsoletely spotted with yellow; feet black, anterior femora pale beneath; abdomen shorter than the wings, slender, somewhat broader before the apex, triquetral, black, the base pruinose, the seventh segment each side with a lateral spot, which is long, triangular, segments 5—6 each side with a lateral line, yellowish; appendages black; anterior genital lamina each side with an impressed, flat, pyriform lobe; hamule not prominent; wings hyaline; pterostigma oblong, fuscous; membranule blackish-gray. Adult male.

Six antecubitals; four postcubitals; two discoidal areolets.

Length 24 millim. Alar expanse 37 millim. Pterostigma 2 millim.

Hab. Cuba (Poey).

ERYTHEMIS Hagen.

Eyes connected in a short space; posterior lobe of the prothorax large, broad, bilobed; abdomen a little shorter than the wings, broad, depressed, the apex sensibly narrower; feet long, rather strong; first sector of the triangle a little sinuated; triangle moderate, narrow; caudal appendages short; genital organs hardly prominent; vulva disclosed or obtected, the segment following it a little carinated, bituberculated; sides of the eighth abdominal segment of the female not dilated.

1. E. furcata!

Erythemis furcata Hagen!

Ferruginous; front luteous; feet black, femora rufo-fuscous; superior appendages of the male recurved, thicker at the apex; the inferior appendage short, quadrangular, the apex forked; anterior genital lamina prominent, forked; vulva disclosed, the apex of the lamina excised; wings hyaline, base of the hind ones narrowly orange; pterostigma oblong, luteous; membranule black; nine antecubitals; eight postcubitals; three discoidal areolets.

Length 40 millim. Alar expanse 70 millim. Pterostigma 4 millim.

Hab. Cuba (Osten Sacken); Bahia, Brazil; Tampico, Mexico (Saussure).

2. E. bicolor!

Libellula bicolor Erich.! Schomburgk, Voyag. Guiana III.

♂. Mouth, front and vertex brassy-black; thorax blue-black, subpruinose; abdomen ferruginous, the base black; appendages ferruginous; feet black; wings hyaline, base of the posterior ones narrowly fuscous; pterostigma luteous; membranule black.

♀. Luteo-testaceous; incisures of the abdomen black; feet black, anterior femora luteous beneath; vulvar lamina produced, erect, acute, triangular; wings subfumose, the apex a little infuscated, the base of the posterior ones yellowish; 12—14 antecubitals; 9—10 postcubitals; three discoidal areolets.

Length 40 millim. Alar expanse 63 millim. Pterostigma 3 millim.

Hab. Choco, New Grenada (Schott); Surinam, Guiana; Brazil.

Is it different from *Libellula peruviana* Rambur?

3. E. longipes!

Erythemis longipes Hagen!

Rufous; mouth rufo-fuscous, front chalybeous above; thorax villose, rufo-fuscous; feet brownish-black, slender, very long; abdomen longer, depressed, rufo-fuscous, the sides yellow; superior appendages of the male rufo-fuscous, long, cylindrical, the apex thicker, beneath upon the middle a little inflated; the inferior appendage triangular, acute; vulvar lamina broad, excised in the middle; wings hyaline with red veins, the base of the posterior

wings flavescent; pterostigma oblong, yellow; membranule black; 8—9 antecubitals; 6—7 postcubitals; two discoidal areolets.

Length 38 millim. Alar expanse 66 millim. Pterostigma 3 millim.

Hab. Cuba (Poey); Minas Geraes, Rio Janeiro, Brazil.

MESOTHEMIS Hagen.

Eyes connected in a short space; posterior lobe of the prothorax large, broad, bilobed; abdomen a little shorter than the wings, narrow, triquetral, the base compressed, somewhat broadened before the apex; feet long, rather strong; the first sector of the triangle sinuated; the triangle moderate, narrow; appendages short; genital organs not prominent; vulva obtected; sides of the eighth segment of the female not dilated.

1. M. simplicicollis!

Libellula simplicicollis Say, Journ. Acad. Philad. VIII, 28, 16. *Libellula caerulans* Ramb.! Neuropt. 64, 44 (♂). Selys! Poey, Ins. Cuba, 448. *Libellula maculiventris* Ramb.! Neuropt. 87, 78 (♀).

Yellowish-green; mouth and front yellowish, a narrow black band before the eyes; thorax yellowish-green, the sides inferiorly varied with black; abdomen compressed at base, vesiculose, triquetral, a little broader before the apex, yellowish-green, the sutures and margins black, the segments 4—10 with a quadrangular, dorsal spot behind, black; the last segments sometimes altogether black; venter obscure; appendages yellow; feet black, the anterior femora yellowish beneath; the vulvar lamina erect, triangular, excavated; wings hyaline; pterostigma oblong, yellow; membranule black.

Adult Male. Thorax and abdomen blue-pruinose.

11—12 antecubitals; 9—12 postcubitals; three discoidal areolets.

Length 41—45 millim. Alar expanse 60—70 millim. Pterostigma 3½—4 millim.

Hab. Indiana; Illinois; Massachusetts; Philadelphia; New York; New Jersey; Savannah; Florida; New Orleans; Pecos River, Texas (Capt. Pope); Matamoras, Huastec (Saussure), Mexico; Cuba.

A common species.

2. M. collocata!

Mesothemis collocata Hagen!

Yellowish-green; mouth and front yellowish, a narrow black band before the eyes; thorax yellowish-green, dorsum with a black spot each side, the sides with three oblique lines, the middle one interrupted, a spot behind, and some streaks at the feet, black; feet black, anterior femora yellowish beneath; abdomen compressed at base, vesiculose, triquetral, the apex almost equal, yellowish-green, the sutures and margins all banded with black; appendages black; wings hyaline; pterostigma oblong, yellow; membranule black. Teneral male.

11—12 anteeubitals; nine posteubitals; three discoidal areolets.

Length 43 millim. Alar expanse 67 millim. Pterostigma 3 millim.

Hab. Pecos River, Western Texas (Capt. Pope).

3. M. corrupta!

Mesothemis corrupta Hagen!

Luteous; mouth, front and vertex yellowish; head robust; thorax luteo-fuscous, clothed with white hairs; dorsum with a white stripe each side; sides each with two oblique white stripes, and at the feet a sulphureous spot, which is bounded inferiorly with fuscous; feet black, yellow above, tarsi black; abdomen stoutish, the base a little more robust, luteous (with the teneral ones, whitish-yellow); each side an arcuated fuscous stripe, dorsum with an interrupted stripe, two points upon the apical segments, and a larger spot upon the middle of segments 8 and 9, fuscous; an interrupted, whitish, ventral stripe; appendages yellow; vulvar lamina flat, the apex emarginated; wings hyaline, with yellow veins; pterostigma oblong, yellow, fuscous in the middle; membranule white; seven anteeubitals; 6—7 posteubitals; three discoidal areolets.

Length 37—43 millim. Alar expanse 58—64 millim. Pterostigma 3 millim.

Hab. Pecos River, Western Texas (Capt. Pope); Illinois (Kennicott); Matamoras, Mexico; Ajan, Sea of Ochotsk.

The adult male from Matamoras is obscurer, the pterostigmata are uni-colored, luteo-fuscous.

4. M. illota!

Mesothemis illota Hagen!

Luteous; mouth yellowish, front rufous above; thorax luteous, with luteous hair, the sides each with two white spots at the feet, which are margined beneath with fuscous; feet luteous; abdomen rufous, appendages rufous; wings hyaline, veined with luteous, the base, and anterior margin as far as the nodus, flavescent; the anterior wings with one rufo-fuscous, basal streak, the posterior ones with a double one; pterostigma luteo-fuscous; membranule whitish. Male.

Nine antecubitals; seven postcubitals; three discoidal areolets.

Length 37 millim. Alar expanse 56 millim. Pterostigma $2\frac{1}{2}$ millim.

Hab. North California; Mexico.

I saw a female from Ajan (Sea of Ochotsk), which was a little larger; the alar expanse was 62 millim.:—the anterior margin of the wings all flavescent, no basal streaks, the thorax upon each of the sides with two oblique white stripes; the feet blackish-fuscous; is it the same species?

Libellula gilva Hagen, from Columbia, is very similar to *M. illota*:—I am in doubt whether it is different.

5. M. attala.

Libellula attala Selys. Poey, Ins. Cuba, p. 445.

Blackish-smoky; base of the abdomen inflated, the dorsum with obsolete rufous spots each side; feet blackish; wings hyaline, veined with black, anterior ones with a small, basal spot, upon the posterior wings the spot is larger and produced almost to the origin of the triangle, fuscous; pterostigma moderate, brownish-olive. (From the description of De Selys Longchamps.)

Fifteen antecubitals; nine postcubitals; three discoidal areolets.

Length 42 millim. Alar expanse 70 millim. Pterostigma 3 millim.

Hab. Cuba.

This is *Libellula annulata* Rambur, 78, 65, in part.

6. M. mithra.

Libellula mithra Selys. Poey, Ins. Cuba, p. 446. *Libellula annulata* Ramb. Neuropt. 78, 65 (in part).

Very much like the preceding species, but the posterior wings

are narrower, and the basal spot smaller. (From the description of De Selys Longchamps.)

Length 40 millim. Alar expanse 66 millim.

Hab. Island of Martinique.

7. M. longipennis!

Libellula longipennis Burm. Handb. II, 850, 12. *Libellula socia* Ramb.! Neuropt. 96, 94. *Libellula truncatula* Ramb. Neuropt. 95, 92?

Fuscous; mouth and front yellowish-white; vertex, and front superiorly, chalybeous; thorax fuscous, clothed with luteous-hairs, dorsum each side with a streak, and a transverse line at the wings, yellow; sides yellow, with three oblique, fuscous lines; abdomen triquetral, short, sensibly attenuated; of the female, broader at the apex, yellowish, dorsum with three broad, fuscous stripes, confluent towards the apex; the last segment extremely short; appendages black; abdomen of the adult male (more rarely of the female), pruinose; feet black; wings hyaline, veins black, the base flavescent; of the adult male often dusky towards the apex; posterior wings of the male, with a double fuscous streak at base; wings of the female hardly flavescent, with no basal streaks; pterostigma fulvous; membranule black; six antecubitals; six postcubitals; three discoidal areolets.

Length 35—44 millim. Alar expanse 59—70 millim. Pterostigma 3—4 millim.

Hab. Maryland; New York; Illinois; Savannah, Dalton, Georgia; Florida; New Orleans, Louisiana; Pecos River, Western Texas (Capt. Pope); North California; Matamoras, Mexico. A common species.

Specimens from Western Texas have the thorax and abdomen almost entirely brassy-black; but they are not different from the others.

A male from California has the thorax and abdomen very pruinose, the extreme base of the wings only is flavescent, and the fuscous streaks are almost absent.

DIPLAX Charp.

Eyes connected in a short space; posterior lobe of the prothorax large, broad, bilobed; abdomen a little shorter than the wings, slender triquetral, the base compressed; feet long, slender; the

first sector of the triangle sinuated; triangle moderate, broad; caudal appendages short; the genital organs not prominent; vulva obtected; the sides of the eighth segment in the female not dilated.

1. D. assimilata!

Libellula assimilata Uhler! Proc. Acad. Philad. 1857, 88, 6.

Yellowish; mouth and front pale yellow, a narrow black band before the eyes; dorsum of the thorax luteous, sides yellow; abdomen slender, the base compressed, inflated, yellowish, dorsum of the first and second segments black at base, segments 4—9 each side with a marginal, black stripe; appendages yellowish, the inferior one triangular, truncated at the apex and a little excised; vulvar lamina short, narrow, almost quadrangular, inflated, bifid, recurved at the apex; feet black, the femora partly yellowish; wings hyaline, the base flavescent, the basal half with the males and sometimes with the females, flavescent; pterostigma short, yellow, obscure in the middle, membranule white; 7—9 antecubitals; 6—8 postcubitals; three discoidal areolets.

Length 33—37 millim. Alar expanse 56—60 millim. Pterostigma $2\frac{1}{2}$ millim.

Hab. Fort Union, Nebraska (Dr. Suckley); Illinois and Wisconsin (Kennicott); St. Louis; Washington; Chicago (Osten Sacken); Pennsylvania; Maryland (Uhler).

It is very much like *Diplax flaveola* Linn. of Europe.

2. D. madida!

Diplax madida Hagen!

Flavescent; dorsum of the thorax luteous; the sides yellow, with two of the sutures black; abdomen yellowish, the two basal segments black at base; segments 3—5 each side with the lateral margin and a lateral stripe, black; feet black, the anterior femora yellow beneath; wings fumose, the anterior margin, and the base of the posteriors, flavescent; pterostigma long, narrow, yellow; membranule white. Female.

Six antecubitals; six postcubitals; three discoidal areolets.

Length — ? Alar expanse 58 millim. Pterostigma 3 millim.

Hab. Upper Missouri.

Described from a single, mutilated specimen; the head, and apex of the abdomen is destroyed.

3. D. costifera!

Libellula costifera Uhler! Mss.

Yellowish; thorax densely covered with long whitish hairs; second segment of the abdomen with a dorsal, triangular, fuscous spot, the following segments having the lateral margin black; the vulvar lamina short, truncated, excavated, a little erected; feet yellow; wings hyaline, the anterior margin and immediate base, flavescent; pterostigma broadened, yellow; membranule white. (Teneral female). Adult female:—sides of the thorax whitish-yellow, with a black vestige upon the posterior suture; the abdomen is a little pruinose beneath, the eighth and ninth segments have an ill-defined, longitudinal, black spot upon the middle; the femora have a black line exteriorly, and the tarsi are black. The genital hamule of the male is bifid, the branches widely separated, the posterior branch elongately-triangular, at tip a little decurved, the anterior branch shorter, very slender, strongly recurved, acute at the apex, the extreme point black; genital lobe oblong, slightly rounded at tip, hairy; denticles of the superior appendage subequal; inferior appendage but little shorter than the superiors, triangular, rounded at the sides, emarginate at tip, and with a minute denticle each side; 7—8 antecubitals; 5—6 postcubitals; three discoidal areolets.

Length 35—39 millim. Alar expanse 58—60 millim. Pterostigma 3 millim.

Hab. Massachusetts (Scudder); New York (Edwards).

4. D. vicina!

Diplax vicina Hagen!

Yellowish-red; front rufescent above, with a small, black band before the eyes; thorax and abdomen yellowish-red or altogether yellowish (teneral); abdomen compressed at base, very much inflated beneath; hamules longly bifid, the branches equal; vulvar lamina truncated, erect, excavated; feet yellowish-red; wings hyaline, veins luteous, the extreme base flavescent; pterostigma oblong, luteous, broader in the middle; membranule whitish gray; 6—7 antecubitals; six postcubitals; three discoidal areolets.

Length 31—36 millim. Alar expanse 46—52 millim. Pterostigma $2\frac{1}{2}$ millim.

Hab. Bergen Hill, New Jersey; Pennsylvania; Washington (Osten Sacken).

Similar to D *costifera*, but the base of the abdomen is more inflated, the pterostigma shorter and broader, the anterior margin of the wings clear hyaline. Is it distinct? May it not be a variety?

5. D. semicincta!

Libellula semicincta Say. Jour. Acad. Philad. VIII, 27, 15.

Rufous; front yellowish-red, with a broader black stripe before the eyes; dorsum of the thorax rufous, the sides inferiorly with two obsolete, luteous spots, which are margined in part with black; feet black, the anterior femora luteous beneath; abdomen short, triquetral, the base a little inflated, rufo-fuscous, the lateral margin and venter black; the superior appendages rufous, cylindrical, the apex black, before the apex beneath with a larger tooth; the inferior appendage hardly shorter, black, triangular, the apex a little excised; genital hamule short, bifid, the external branch stout, conical, the internal one equal, unguiculated; the genital lobe of the length of the hamule, the apex rounded, broader; wings hyaline, fuscescent from the base to the nodus (not extending so far upon the anterior wings); pterostigma quadrangular, fulvous, surrounded with black nerves; membranule white. Male.

Seven antecubitals; six postcubitals; three discoidal areolets.

Length 30 millim. Alar expanse 46 millim. Pterostigma 2 millim.

Hab. Indiana; Massachusetts (Say); Pennsylvania; Maryland (Uhler).

6. D. rubicundula!

Libellula rubicundula Say. Jour. Acad. Philad. VIII, 26, 14. *Libellula ambigua* Ramb. Neuropt. 106, 105; Selys, Revue Odonat. 325.

Yellowish-subrufescent; front yellowish, with a black band before the eyes; thorax rufous, the sides sometimes luteous; feet black, anterior femora luteous beneath; abdomen rather long, slender, sanguineous (adult male), or yellowish rufous, the sides with a maculose, black stripe; appendages rufescent; superior ones of the male longer, the apex acute, recurved, beneath upon the middle with a stouter tooth; inferior appendage shorter, rufescent, triangular, the apex a little excised; the genital hamule rather long, very bifid, the external branch triangular, the internal one a little longer, narrow, subincurved; the genital lobe short, triangular, the apex narrow; vulvar lamina small, triangular, the base inflated,

longly bifid; wings hyaline, the extreme base yellowish; pterostigma quadrangular, fuscous, terminated at each end with pale; membranule white; 7—8 antecubitals; 7—8 postcubitals; three discoidal areolets.

Length 32—37 millim. Alar expanse 50—58 millim. Pterostigma 2 millim.

Hab. Indiana; Massachusetts (Say); Maryland (Uhler); Bergen Hill, New Jersey (Guex); Chicago; Washington; New York; Philadelphia (Osten Sacken).

A common species. The variety described by Say l. c. p. 27, "wings with the basal half ferruginous"—is unknown to me.

I possess a male from Chicago most like this species, except that the form of the hamules is different; being shorter, the apex only bifid, the external branch broad, truncated; the internal branch small, unguiculated:—is it a distinct species?

7. D. albifrons!

Libellula albifrons Charp.! Libell. Europ. 14; tab. ix, fig. 3.—*Libellula ambigua* Selys, Revue Odonat. 325.

Yellowish-subrufescent; front narrow, yellow, no band before the eyes; dorsum of the thorax luteo-fuscous, the sides paler, varied with fuscous at the feet; feet luteous, the anterior femora exteriorly, and the tarsi partly, fuscous; abdomen long, slender, sanguineous (adult male), or luteous; segments 1 and 2 at base, and segments 4—9 each side at the apex, with a triangular, black spot; appendages luteo-rufous, superior ones of the male long, the apex acute, recurved, beneath in the middle with a stout tooth; inferior appendage shorter, triangular, the apex a little excised; hamules long, the apex bifid, the external branch small, stout, truncated; the internal branch longer, narrow, unguiculated; genital lobe shorter, triangular; vulvar lamina broad, short, rounded, the apex a little incised on the middle; wings hyaline, extreme base a little flavescent; pterostigma quadrangular, fuscous, terminated at each end with pale; membranule whitish-cinereous; eight antecubitals; 6—8 postcubitals; three discoidal areolets.

Length 33—36 millim. Alar expanse 54—58 millim. Pterostigma 2 millim.

Hab Georgia (Abbot); St. Louis (Engelmann).

I possess the male described and figured by Charpentier; the locality as reported by him ("Switzerland") is erroneous.

8. D. berenice!

Libellula berenice Drury, Ins. I, 114; tab. xlviii, fig. 3. Oliv. Enc. Meth.; Say, Jour. Acad. Philad. VIII, 25, 13; Rambur, Neuropt. 88, 80.—*Libellula histrio* Burm.! Handb. II, 849, 7. ♀.

Black; mouth black, the labium yellow each side; front black beneath, with a yellow spot each side, above and the vertex chalybeous; eyes black posteriorly, spotted with yellow; thorax black, subpruinose; the sides of the same color, or (teneral) with some yellow spots towards the legs; feet black; abdomen slender, triquetral, the base hardly inflated, altogether black, subpruinose (adult male), or with segments 3—7 having a yellow spot each side (male and female, less adult); or black, and segments 3—7 with a large, phalerated, fulvous spot, divided by a medial black line; the last segment partly fulvous (teneral female); appendages black; the vulvar lamina long, erect, triangular, excavated; wings hyaline, base of the posterior ones, in the female, subrufous; pterostigma long, yellow; membranule black.

Var. ♀ (*L. histrio* Burm.). Labium yellow, the middle narrowly black; labrum yellow, margined with black; front yellow, with a transverse black stripe, and a small T-shaped chalybeous spot above; vertex chalybeous, with a bright yellow spot above; prothorax black, spotted with yellow; thorax bright yellow, the middle sulcus and a double stripe, which is joined together at each end, black; sides yellow, with five partly interrupted, oblique, black streaks; the more adult female has the black markings broader and more confluent; feet black, extreme base of the femora yellow; abdomen black, segments 1—7 with a large, dorsal, phalerated spot, incisures black; the tenth segment and appendages fulvous; wings hyaline, the extreme base flavescent, all the wings with a large medial, fuscescent cloud; pterostigma yellow; membranule black; nine antecubitals; 7—9 postcubitals; three discoidal areolets.

Length 32—34 millim. Alar expanse 50 millim. Pterostigma 3 millim.

Hab. Bergen Hill, New Jersey (Guex); New York; Maryland (Uhler); Virginia. A common species. I possess a male and female of the variety, taken in copula.

9. D. scotica!

Libellula scotica Donovan; Selys! Revue des Odonat. 48, 22 (with the synonyms).

Fuseo-olivaceous; labium yellow, with a middle black band; labrum yellow, margined with black; front yellow, a band anteriorly, obsolete or absent with the female, and another before the eyes, black; dorsum of the thorax olivaceous, the middle sulcus broadly, triangularly black; dorsum of the male sometimes fuscous, the middle black, with two yellowish spots each side; sides yellow, with a broad, oblique black band; beneath black, with three cordiform, yellow spots; feet black; abdomen short, triquetral, black, each side with a yellow, maculose stripe; dorsum of the abdomen entirely fulvous in the females; appendages black; vulvar lamina triangular, erect, excavated; wings hyaline, posterior ones of the females flavescent at the extreme base; pterostigma quadrangular, black; membranule whitish.

Adult Male. Mouth, and the front almost entirely, black; thorax and abdomen black, with the yellowish marks absent, or almost absent. Seven antecubitals; 5—7 postcubitals; three discoidal areolets.

Length 33 millim. Alar expanse 52 millim. Pterostigma 2 millim.

Hab. North Red River (Robt. Kennicott); almost everywhere in Europe; Asia; Wilui River, Irkoutsk, Siberia.

The American specimens are hardly distinct; but the color is a little different; the black labial stripe is narrow anteriorly, triangular; the dorsum of the thorax is of an olive fuscous color, transversely interrupted, so as to appear 4-spotted; dorsal middle of the abdomen, in the female, somewhat black.

10. D. intacta!

Diplax intacta Hagen!

Fuscous; mouth and front white; labium in the middle (♀) black, and in adult male, all black; front with a black band before the eyes; vertex black, with a pale spot above, or all black (adult); thorax nigro-fuscous, dorsum each side with an obsolete fulvous stripe, sides fuscous, obsoletely varied with black; the adult male has the thorax brassy-black; feet black; abdomen short, somewhat broader before the apex, fuscous, with dorsal, phalerate, fulvous spots; upon the base and segments 6—7 they are larger; or black,

with a dorsal yellowish spot upon the seventh segment (adult male); appendages black; the inferior one half the length of the superiors, quadrangular, broadly bifid; wings hyaline, posterior ones at base, with a triangular black spot; base of the wings, in the females, flavescent; pterostigma short, quadrangular, black; membranule blackish-gray; 7—8 antecubitals; 7—9 postcubitals; three discoidal areolets.

Length 32 millim. Alar expanse 52 millim. Pterostigma 2 millim.

Hab. Wisconsin (Dr. Hoy); Chicago (Osten Sacken); Ohio (Schaum); Massachusetts (Scudder).

11. D. hudsonica.

Libellula hudsonica Selys, Revue des Odonat. 53.

Similar to *Diplax dubia* Vander Linden (perhaps its variety ?); it differs in being smaller, the basal spot of the posterior wings is small, the reticulation of the wings is less narrow; the vertex is yellow above; the labrum is hardly margined with black; the teeth upon the inferior surface of the superior appendages of the male are almost equal. (From the description of De Selys Longchamps.)

Length 27 millim. Alar expanse 46 millim.

Hab. New Brunswick; Hudson's Bay.

12. D. dubia!

L. dubia Selys! Revue des Odonat. 50, 21.

Black; front white, labium black, labrum white, margined with black; the vertex and a band before the eyes, black; thorax obscure brassy-green, with brown villosity; dorsum with a subinterrupted, fulvous stripe each side; sides spotted with fulvous; feet black; abdomen slender, triquetral, the dorsum spotted with yellow, base spotted, and segments 6 and 7 with larger spots; wings hyaline, or fumose, sometimes with the base flavescent, anterior ones with two basal points, and the posterior ones with a point and triangular spot at base, black; pterostigma quadrangular, nigrofuscous; membranule cinereous; eight antecubitals; seven postcubitals; three discoidal areolets.

Length 37 millim. Alar expanse 58 millim. Pterostigma 2 millim.

Hab. Europe.

13. D. ochracea!

Libellula ochracea Burm.! Handb. III, 854, 38.—*Libellula fervida* Erichs.! Voyag. Schomburgk II, 584.—*Libellula justiniana* Selys. Poey, Ins. Cuba, 450.

Rufous, or yellowish; mouth yellow, front rufous above; thorax rufous or yellow, dorsum pointed with fuscous; sides inferiorly bright yellow; feet black, base of the femora partly yellowish; abdomen a little thickened, short, triquetral, rufous or yellowish, a dorsal stripe and each side a lateral one, submaculose, nigro-fuscous; the apical segment and appendages yellowish; genital hamule bifid, the external branch stout, truncated; the internal branch small, unguiculated; genital lobe equal, obliquely truncated behind; vulvar lamina triangular, erect, excavated; wings hyaline, the base flavescent, or rufescent; pterostigma rather long, oblong, yellowish; membranule blackish-gray.

Adult Male. Almost entirely rufous;—female with the apex of the wings sometimes a little infuscated. I saw a very adult male from Surinam, which was almost entirely black, the front chalybeous above, the base of the wings brownish-black, and the abdomen partly pruinose. 10—11 antecubitals; 7—8 postcubitals; three discoidal areolets, then two.

Length 30—35 millim. Alar expanse 50—56 millim. Pterostigma 3 millim.

Hab. Choco, New Grenada (Schott); Cuba (Poey); Surinam, British Guiana; Bahia, Brazil; Porto Cabello, Venezuela; Tampico, Mexico (Saussure).

It is a common species in meridional America.

14. D. justiniana.

Libellula justiniana Selys. Poey, Ins. Cuba, 450.—*Libellula minuscula* Ramb. Neuropt. 115, 118, in part.

Fuscous; front above, and the vertex chalybeous (adult male), or yellowish (teneral male and female); thorax yellow, dorsum each side fuscous, or altogether blackish-fuscous (adult male); feet black, femora yellowish in part; abdomen short, slender, triquetral, yellowish, each side spotted with black, or black, pruinose (adult male); appendages brownish-black; genital lobe broader at the apex, oval; vulvar lamina broad, oval, excavated, suberect; wings hyaline, base of the anterior ones a little flavescent, base of the posteriors broadly rufo-fuscous, or flavescent (♀); pterostigma

oblong, yellow; membranule nigro-cinereous; 8—10 antecubitals; 6—7 postcubitals; three discoidal areolets, then two.

Length 25—31 millim. Alar expanse 38—47 millim. Pterostigma 2—2½ millim.

Hab. Cuba (Poey).

15. D. elisa!

Diplax elisa Hagen!

Fuscous, head yellowish in front, the labium with a medial, fuscous stripe; front with a narrow black band before the eyes; thorax fuscous, the middle sulcus obscurer; the sides fuscous or yellow, moderately punctated with black; feet black, base of the femora partly yellowish; abdomen a little thickened, triquetral, black, segments 1—7 with a dorsal, larger, phalerate, yellow spot; appendages yellowish; genital lobe narrow, small, triangular; vulvar lamina broad, oval, the apex excised; wings hyaline, the anterior margin and base flavescent, an apical and ante-apical fuscous spot; anterior wing at base with a small spot, and the posterior ones with a large fuscous spot, which is lacerated, divided, veined with yellow, and a broad yellow band; antecubital veins margined with fuscous in part; pterostigma oblong, large, yellow; membranules white; eight antecubitals; 7—8 postcubitals; three discoidal areolets.

Length 33 millim. Alar expanse 60 millim. Pterostigma 3 millim.

Hab. Bergen Hill, New Jersey (Guex); Chicago; New York (Osten Sacken).

16. D. ornata!

Diplax ornata Ramb. Neuropt. 96, 93.

Yellow varied with black; head yellow in front, labium with a black stripe in the middle; front with a narrow black band before the eyes; thorax yellow, dorsum with a broad, medial, black stripe; sides yellow, with three oblique, black, somewhat brassy stripes; abdomen triquetral, black, segment 1—7 with a dorsal, large, phalerate, yellow spot; superior appendages yellow, the inferior one fuscous; genital lobe narrow, linear; vulvar lamina short, truncated, each side with an inflated tubercle; feet black, the anterior femora yellowish at base; wings hyaline, the posterior ones with a large, basal, fulvous spot, and two lacerated, fuscous stripes, the

anterior one narrow, bipartite; the female sometimes has the base of the anterior wings flavescent, and some of the antecubital nervules marked with fuscous. I have also seen females with the fulvous spot and the fuscous stripes on the posterior wings very small; pterostigma oblong, yellow; membranule white, cinereous inwardly.

Adult Male. Almost entirely black, subpruinose.

6—9 antecubitals; 5—7 postcubitals; three discoidal areolets, then two.

Length 30—32 millim. Alar expanse 55 millim. Pterostigma $2\frac{1}{2}$ millim.

Hab. Philadelphia; Florida (Norton).

17. D. amanda!

Libellula pulchella Burm.! Handb. II, 849, 2.

Bright yellow; mouth and front yellow, before the eyes a narrow fuscous band; thorax yellow, dorsum with a broad black stripe; sides yellow, sutures fuscous at the wings; abdomen triquetral, yellow, the segments black posteriorly, the three last black; appendages yellow; feet black; femora partly yellow; genital lobe narrow linear; vulvar lamina rounded, excised in the middle; base of the wings broadly flavescent, the posterior ones with a double stripe, veined with yellow, the anterior one narrower, bipartite, fuscous; pterostigma short, yellow; membranule white; eight antecubitals; five postcubitals; two discoidal areolets.

Length 25—27 millim. Alar expanse 44—47 millim. Pterostigma $1\frac{3}{4}$ millim.

Hab. Savannah, Georgia.

18. D. minuscula!

Libellula minuscula Ramb.! Neuropt. 115, 118.

Yellow, varied with black; front yellow, above chalybeous; thorax black, pruinose (adult male), or yellow, dorsum each side, with a fuscous stripe; the sides yellow, the sutures narrowly fuscous; feet black, anterior femora yellowish at base; abdomen short, triquetral, yellow, the dorsum with three maculose, black stripes, and the apex black; appendages pale yellow; vulvar lamina triangular, erect, excavated; wings hyaline, the extreme base of the posterior ones fulvous; pterostigma oblong, yellow; membranule cinereous; eight antecubitals; five postcubitals; two discoidal areolets.

Length 21—26 millim. Alar expanse 34—46 millim. Pterostigma $1\frac{1}{2}$—2 millim.

Hab. Kentucky; Georgia; Florida; Brazil.

19. D. credula!

Diplax credulà Hagen!

Fuscous; mouth luteous, front rufo-fuscous above; dorsum of the thorax fuscous, a luteous stripe upon the middle; sides luteous; feet brownish-black, base of the femora luteous; abdomen rather long, triquetral, the base compressed, inflated, nigro-fuscous, subpruinose, with the base fuscous (male), or luteous, with the dorsal middle fuscous, and the incisures nigro-fuscous (female); vulvar lamina triangular, excavated; wings hyaline, the extreme base of the posterior ones fulvescent; pterostigma larger, yellow; membranule black; twelve antecubitals; ten postcubitals; three discoidal areolets.

Length 38 millim. Alar expanse 62 millim. Pterostigma 4 millim.

Hab. Island of St. Thomas; Minas Geraes, Brazil.

20. D. abjecta!

Libellula abjecta Ramb.! Neuropt. 83, 73.

Brownish-black; mouth fuscous, front chalybeous above; thorax nigro-fuscous; feet black; abdomen slender, triquetral, the base hardly inflated, nigro-fuscous, pruinose; appendages fuscous; vulvar lamina triangular, erect, excavated; wings hyaline, the extreme base of the posterior ones fuscous; pterostigma large, yellow; membranule black; eleven antecubitals; seven postcubitals; three discoidal areolets.

Length 38 millim. Alar expanse 58 millim. Pterostigma $3\frac{1}{2}$ millim.

Hab. Cuba; Venezuela; Brazil.

In specimens from Cuba, the basal spot of the posterior wings is wanting, or almost wanting, but they are not different. *D. abjecta* is similar to the preceding species, but the posterior lobe of the prothorax is small: does it belong to this genus? It may be an *Erythemis?*

21. D. imbuta.

Libellula imbuta Say, Journ. Acad. Philad. VIII, 32.

♂. Abdomen red, the segments black at apex; thorax green; vertex chalybeous.

♀. Abdomen greenish, segments black at the apex.

Hab. Island of Sanipuxten, coast of Maryland. (From the description of Say.) It is entirely unknown to me.

PERITHEMIS Hagen.

Eyes connected in a short space; posterior lobe of the prothorax large, broad, bilobed; abdomen much shorter than the wings, broad, depressed, narrower at base; legs moderate, slender; the first sector of the triangle hardly sinuated; triangle moderate, broad; caudal appendages short; genital organs not prominent; vulva obtected; sides of the eighth segment of the female not dilated.

1. P. domitia!

Libellula domitia Drury, Ins. II, 83; pl. xlv, fig. 4. Burm. Handb. II, 855, 40. Ramb.! Neuropt. 124, 132.

Var. 1. *Libellula tenuicincta* Say, Jour. Acad. Philad. VIII, 31, 21 (♂). *Libellula tenera* Say, Jour. Acad. Philad. VIII, 31, 20 (♀). *Libellula chlora* Ramb.! Neuropt. 125, 133. *Libellula metella* Selys, Poey Ins. Cuba, 451.

Var. 2. *Libellula iris* Hagen.

Flavescent, villose; the sides of the thorax similarly colored: dorsum of the abdomen, with an interrupted, brownish-black line each side; feet flavescent; wings flavescent (♂), or the basal half flavescent, with two fuscous, transverse stripes, the internal one of which is often almost absent (♀); pterostigma rufo-fuscous; membranule cinereous.

Var. 1. Sides of the thorax fuscous, two interrupted yellow lines each side; all the wings of the male, with a basal, fuscous point.

Var. 2. Sides of the thorax of the same color with the remainder of the body; the wings hyaline, subflavescent, the anterior margin yellow; posterior wings of the female, with a fuscous nebula at the

apex; seven antecubitals; five postcubitals; two discoidal areolets.

Length 23 millim. Alar expanse 36 millim. Pterostigma 2 millim.

Hab. Maryland; New Jersey; Bay of Campeachy; Cuba; Venezuela; Bahia, St. Leopold, Brazil.

Var. 1. Indiana, Pennsylvania, Massachusetts, New York, Louisiana; Matamoras, Mexico; Atlihauzan (Saussure).

Var. 2. Mexico, Alvarado; Brazil.

I saw in the collection of Schneider, *Uracis fastigiata* Burm., from Mexico; the *habitat* is perhaps erroneous; it is a meridional species.

NANNOPHYA Ramb.

Eyes connected in a short space; posterior lobe of the prothorax entire; abdomen shorter than the wings, slender, triquetral; the appendages short; genital organs not prominent; reticulation of the wings large and simple; the triangle large, broad; the first sector of the triangle sinuated.

1. N. bella!

Nannophya bella Uhler! Proc. Acad. Philad. 1857, 87, 1.

♀. Black; mouth black, front and epistoma white, the former with a large quadrangular, black spot, labrum black; vertex chalybeous; thorax black, dorsum each side with an interrupted, yellow line; sides with two oblique stripes and a triangular patch behind, interrupted, yellow; abdomen black, the base, a band at the base of segments 3 and 4, a spot at the base of 5—7, that upon 7 almost obsolete, minute, and the dorsum of the last segment, yellow, segments 8—9 entirely black; feet black; appendages yellow; vulvar lamina large, reaching to the tip of the last segment, triangular, excavated; wings hyaline, fulvous at base; pterostigma small, black; 6—7 antecubitals; 5—6 postcubitals; one discoidal areolet, then two.

Length 18 millim. Alar expanse 32 millim. Pterostigma $1\frac{1}{4}$ millim.

♂. Black, pruinose; mouth black, front white, with a quadrangular black spot inferiorly; vertex chalybeous; thorax and abdomen black, very pruinose; feet black (apex of the abdomen

destroyed); wings hyaline; pterostigma small, black, terminated with a white nervule at each end; membranule white; seven antecubitals; five postcubitals; one discoidal areolet, then two.

Length 18? millim. Alar expanse 30 millim. Pterostigma 1 millim.

Hab. North America (Vienna Museum); Baltimore and New Jersey (Uhler); Maine (Packard); Connecticut (Norton).

2. N. maculosa!

Nannophya maculosa Hagen!

Fuscous; mouth black, nasus white, front chalybeous, each side with a white spot; thorax fuscous, each of the sides with obsolete, yellow spots; feet black; abdomen brownish-black, segments each side with a triangular, yellow spot, the three apical segments brownish-black; appendages white; wings hyaline, base of the posteriors fulvo-fuscous; pterostigma small, yellow; membranule white. (Male.) Eight antecubital veins; five postcubitals; one discoidal areolet; two at the triangle.

Length 20 millim. Alar expanse 31 millim. Pterostigma $1\frac{1}{2}$ millim.

Hab. Georgia (Abbot).

Section II. NEUROPTERA. Erich.

Fam. VII. SIALINA.

Body short, thick; prothorax large; antennæ long, setiform; wings large, reticulated, posterior ones with the anal space plicated; tarsi 5-articulate. The larva with a mandibulated mouth.

SIALIS Latreille.

Prothorax quadrangular, almost equal to the head; no ocelli; antennæ filiform; the wings irregularly reticulated, the veins stout; the fourth article of the tarsi dilated, bilobed.

The larva is aquatic; with lateral branchiæ.

1. S. infumata!

Sialis infumatus Newm.! Entom. Mag. V, 500; Walk. Catal. 195, 2.

Black, head not narrowed posteriorly, a little narrower than the prothorax, the occiput with flat streaks and spots, which are ferruginous and somewhat shining; antennæ rather slender; anterior angles of the prothorax rounded, the sides with impressed points; feet black; wings black, the veins thick and blacker.

Length to tip of wings 12—15 millim. Alar expanse 22—26 millim.

Hab. Arctic America (Richardson); Nova Scotia (Redman); St. Martin's Falls, Albany River, Hudson's Bay (Barnston); Trenton Falls, New York; Washington, in May (Osten Sacken); Baltimore, Maryland; Pennsylvania (Uhler).

A variety has the head spotted beneath with yellow; or the prothorax spotted with black: is it a different species?

2. S. americana!

Semblis americanus Ramb.! Neuropt. 447, 1.—*Sialis ferrugineus* Walk.! Catal. 195, 3.

Ferruginous; head narrower behind, occiput with streaks and spots, which are flat, somewhat shining, and surrounded with black; prothorax a little narrower, the anterior angles square, the sides with yellowish, impressed punctures; antennæ black; feet fuscous, femora ferruginous; wings pale ferruginous, the veins darker ferruginous.

Length to tip of wings 12—14 millim. Alar expanse 24—26 millim.

Hab. Georgia (Abbot); Pennsylvania.

3. S. bifasciata!

Sialis bifasciata Hagen!

Ferruginous; head not narrowed posteriorly, orange-colored, two broad black stripes, the occiput with flat streaks and spots, which are somewhat shining, orange; antennæ stout, black, pilose; anterior angles of the thorax obtuse, orange, each side with a broad, fuscous stripe and flat points, somewhat shining, orange; feet fuscous, femora yellowish, with the base fuscous; wings pale fuscous, somewhat shining, anterior ones obscurer upon the costal margin, the veins pale fuscous.

Length to tip of wings 10—12 millim. Alar expanse 17—20 millim.

Hab. Cuba (Poey).

CHAULIODES Latreille.

Prothorax quadrangular, almost equal to the head; three approximate ocelli; antennæ pectinated or serrated; wings veiny, the transverse veins slender; articles of the tarsi cylindrical; caudal appendages of the male conical, simple.

The larva is unknown; perhaps it is aquatic.

1. Ch. pectinicornis!

Hemerobius pectinicornis Linné, Amoen. Acad. VI, 412. Linné, Centur. Ins. 1763, 29, 87. Linné, Syst. Nat. ed. XII, 911, 1; ed. XIII, vol. V, 2638, 1. Fab. Syst. Ent. 309, 1. De Geer, Mém. III, 562, 2; tab. xxvii, fig. 3. Drury, Ins. I, 105; tab. xlvi, fig. 3.—*Semblis pectinicornis* Fab. Sp. Ins. I, 386, 1. Mant. Ins. I, 244, 1. Entom. Syst. II, 72, 1.—*Chauliodes pectinicornis* Latr. Gen. Crust. III, 198. Burm.! Handb. II, 950, 2. Cuv. Icon. Regn. Anim. Masson. tab. cv, fig. 2. Ramb.! Neuropt. 444, 1. Walk.! Catal. 198, 1.—*Hermes indecisus* Walker! Catal. 204, 7. (Female.)

Luteo-cinereous; antennæ fuscous, pectinated; occiput with yellowish flat streaks and spots; prothorax with a middle stripe behind, and another flexuous one each side, yellowish; feet luteous, tarsi fuscous; the anterior wings subcinereous, obscurely clouded with fuscous, veins with white interrupted spots; the wings sometimes have rather clearly-defined fuscous transverse streaks. Male and female.

Length of body 37—55 millim. Alar expanse 58—90 millim.

Hab. Philadelphia, Pennsylvania; Wilmington, Delaware; Massachusetts; Trenton Falls, New York; Berkeley Springs, Virginia (Osten Sacken); Maryland (Uhler); Columbia (collection of Saussure)—is not this an error?

2. Ch. rastricornis!

Chauliodes rastricornis Ramb.! Neuropt. 444, 2. Walk.! Catal. 198, 2.

Luteo-cinereous; antennæ fuscous, denticulated; occiput with flat black streaks and spots; prothorax posteriorly, with a flexuous stripe each side, obsolete upon the middle, impressed; feet luteous,

tarsi fuscous; anterior wings subcinereous, obscurely clouded with fuscous, veins interruptedly white. Female.

Length of body 35—46 millim. Alar expanse 64—80 millim.

Hab. Savannah; South Carolina (Zimmerman).

3. Ch. californicus!

Chauliodes californicus Walker! Catal. 199, 4.—*Hermes dubitatus* Walker! Catal. 204, 6. Female.

Brownish-black; mouth rufous; antennæ serrate? (almost altogether mutilated); occiput with rufous, somewhat shining, flat streaks and spots; prothorax each side posteriorly with a flexuous, obsolete, rufous stripe, elevated and more obsolete in the middle; feet black; anterior wings cinereous, the longitudinal veins transversely lineated with fuscous; a basal, brownish-black streak, and sometimes apical ones upon the costal margin of all the wings.

Length to tip of wings 45—60 millim. Alar expanse 70—100 millim.

Hab. California (Hartweg).

4. Ch. virginiensis.

Chauliodes virginiensis Westw. ed. Drury, I, 105; tab. xlvi, fig. 3.—*Hemerobius virginiensis* Drury, Ill. II, App.—*Hemerobius pectinicornis* Palisot Beauv. Ins. Afr. et Amer. Neuropt. tab. i, fig. 2; Walk. Catal. 200, 6.

Head and thorax black, pointed with fulvous; wings broad, hyaline, the veins pointed with black. (From the description of Walker.)

Alar expanse 72 millim.

Hab. Virginia.

Unknown to me; is it a distinct species? I cannot examine the authority reported by Mr. Westwood: I saw the identical specimen figured by Palisot Beauv., in the collection of De Selys Longchamps; it differs a little from *Ch. pectinicornis* Linn.; but I neglected to make a more complete description of it.

5. Ch. serricornis!

Chauliodes serricornis Say, Long's Exped. II, Append. 307.

Fuscous; head rufous, the disk fuscous, the occiput with flat rufous streaks; antennæ black, serrate; prothorax each side with an impressed, rufous spot; feet luteo-fuscous, the tarsi obscurer;

wings nigro-fuscous, the longitudinal veins obscure, marked with black; anterior wings with a broad, white band, pointed with fuscous, not attaining the posterior margin, an apical marginal spot, and some of the transverse veins with white spots; posterior wings with a broad, arcuated band, not attaining the posterior margin, and a larger anal spot, also an apical small spot, and sometimes the transverse veins spotted, white.

Length to tip of wings 40 millim. Alar expanse 66 millim.

Hab. Arkansas (Nuttall); Pennsylvania; Missouri; Lake of the Woods (Bigsby); Red River of Lake Winnipeg, always rare (Say); New York (collection of Hagen); Maryland (Uhler); Mexico (Muehlenpfordt).

The Mexican specimen has a narrower band, and none to the posterior wings.

6. Ch. maculatus!

Neuromus maculatus Ramb.! Neuropt. 442, 3, tab. x, fig. 2; Walker! Catal. 202, 1.—*Chauliodes serricornis* Burm.! Handb. II, 949, 1.

Black; occiput with flat, ferruginous streaks and spots; antennæ black, serrate; thorax fuscous, impressed each side; feet nigro-fuscous; wings black, a transverse interrupted, middle line, dilated at the anterior margin, but not attaining the posterior margin, and some apical spots, white.

Length to tip of wings 30—36 millim. Alar expanse 45—55 millim.

Hab. Philadelphia; Savannah; Massachusetts (Scudder); Maryland (Uhler).

I saw a male from Massachusetts, communicated to me by Mr. Uhler under the name of *Ch. unifasciatus*, which differs a little; the occipital streaks are black; a band on the anterior wings broader, white, not attaining the margin, and with one apical point. Is it a distinct species?

7. Ch. angusticollis!

Chauliodes angusticollis Hagen!

Fusco-testaceous; antennæ of the male nodulose, erectly-villose, of the female moniliform; occiput with flat, fulvous streaks and spots; prothorax narrow, a middle stripe posteriorly, and each side a lateral one, fulvous; feet fuscous; wings gray, confertly

marked with brownish-black points; appendages of the male stout, oblique, obtuse. (♂ and ♀).

Length to tip of wings 35—42 millim. Alar expanse 60—70 millim.

Hab. Dalton, Georgia; Berkeley Springs, Virginia (Osten Sacken); Northern Illinois (Robt. Kennicott).

CORYDALIS Latreille.

Prothorax quadrangular, much narrower than the head; three large, approximate ocelli; antennæ filiform; mandibles of the male often extremely long, incurved; wings numerously veined; the transverse veins stout; appendages of the male forcipated; tarsi cylindrical.

The larva is aquatic, furnished with abdominal branchiæ.

1. C. cornuta!

Raphidia cornuta Linné, Syst. Nat. ed. XII, 916, 3.—*Hemerobius cornutus* Linné, Syst. Nat. ed. X, 551, 14; De Geer, Mém. III, 559, 1; tab. xxvii, fig. 1; Fab. Sp. Ins. I, 392, 1; Mant. Ins. I, 246, 1; Entom. Syst. II, 81, 1; Linné, Syst. Nat. ed. XIII. V, 2639,20.—*Corydalis cornuta* Latr. Gen. Crust. et Ins. III, 199, 1; Palisot Beauv. Ins. Neuropt. tab. i, fig. 1; Oliv. Enc. Meth. VII, 59; Burm.! Handb. II, 950, 1; Cuvier, Icon. Regn. Anim. ed. Masson. tab. civ.—*Corydalus cornutus* Haldem. Journ. Acad. Boston, 1848, 158; tab. i—iii.

Luteo-fuscous; mandibles of the male elongated; head large, broad, the sides convex; the occiput with impressed, yellow spots and streaks, which are surrounded with fuscous; beneath, each side, with an oblique yellow stripe; prothorax much narrower than the head, a little longer than broad, behind in the middle, with a hastiform streak, and each side with irregular, elevated, flat points, yellow; feet lurid, the knees, and the apex and incisures of the tarsi fuscous; the males have four appendages, the superior ones forcipated, infracted at the apex, dolabrate; wings subcinereo-hyaline, the veins fuscous, middle of the transverse ones, on the anterior row of costal spaces, pale, the areoles each with two white dots; those of the disk with white points.

Length to tip of wings 75 millim. Alar expanse 100—135 millim.

Hab. Canada; Pennsylvania; New York; Madrid; Carolina; Northern Illinois (Kennicott); Maryland (Uhler).

2. C. lutea!

Corydalis lutea Hagen!

Luteous; mandibles impressed at base superiorly, transversely sulcated, of the male a little elongated; head large, broad, ferruginous, the sides convex; the occiput with obsolete, luteous spots; prothorax much narrower than the head, longer than broad, each side of the middle obsoletely impressed, luteous spots behind and at the sides; feet lurid, base of the tibiæ, base and apex of the first and second articles of the tarsi, and the other articles entirely nigro-fuscous; male with four appendages, the superior ones cylindrical, long, oblique, truncated at the apex; the inferior ones recurved at the apex, clavate; wings luteo-hyaline, veins luteous, partly fuscous, with a few white points. (♂ and ♀.)

Length of body 70—85 millim. Alar expanse 110—140 millim.

Hab. Mexico (Sallé); Cordova (Saussure).

3. C. cognata!

Corydalis cognata Hagen!

Luteous-yellow; male with elongated mandibles; head large, broad, the sides convex; the occiput behind with two punctate ochraceous streaks and a few obsolete points; prothorax almost quadrangular, a little narrower than the head, behind with a hastiform streak upon the middle, and lateral, elevated ochraceous points; feet lurid, apex of the tarsi obscurer, nails fuscous; wings yellowish-hyaline, the transverse veins fuscous; upon the base and apex of the costal space, a fuscous mark; costal areoles with a single white point, the other areoles with a series of white points, at the radius clouded with fuscous.

Length to tip of wings 60 millim. Alar expanse 100 millim.

Hab. Pecos River, Western Texas (Capt. Pope's Expedition).

4. C. soror!

Corydalis soror Hagen!

Luteous; mandibles of the male not elongated; head broad, depressed, the sides flat, with an alate, bidentate process; a fuscous stripe each side; antennæ short, slender, black, the two basal articles yellowish; prothorax narrower than the head, longer than broad, each side with a fuscous, trifoveolated stripe; feet lurid, the knees and apex of the tarsi obscurer; appendages of the male four,

the superior ones forcipated, clavate at the apex, the inferior appendages extremely short, cylindrical; wings luteo-subhyaline, an obsolete band upon the middle of the anterior ones, and some spots nearer the apex, fuscous; veins fuscous, luteous upon the middle of the costal space. (♂ and ♀.)

Length to tip of wings 60—75 millim. Alar expanse 85—130 millim.

Hab. Mexico (Koppe); Cordova (Saussure).

5. C. hieroglyphica!

Neuromus hieroglyphicus Ramb.! Neuropt. 442, 2. *Hermes hieroglyphicus* Walk.! Catal. 206, 12.

Pale yellow; mandibles of the male not elongated; antennæ black, with the base yellow; head with the sides convex; prothorax cylindrical; occiput with two spots, prothorax with four, and the mesothorax with two spots, black; appendages of the male, the superior ones longer, with the apex recurved; the inferior ones stout, with the apex clavated; feet yellow, base and apex of the tibiæ, and apex of the tarsi black; wings yellowish-hyaline, the transverse veins in part black; the anterior wings spotted with black posteriorly.

Length to tip of wings 40—63 millim. Alar expanse 64—90 millim.

Hab. Mexico (Ehrenberg); Venezuela; Brazil.

It varies very much in size and marking; sometimes it is almost unicolored, pale yellow.

RAPHIDIA Linné.

Prothorax cylindrical, long, much narrower than the head; antennæ short, filiform; wings with a pterostigma; anal space of the posterior wings very small, inflexed; the third article of the tarsi dilated, bilobed; the fourth article extremely short, cylindrical; vagina of the female long, ensiform.

Larva living under bark.

† Three ocelli.

1. Raph. adnixa!

Raphidia adnixa Hagen!

Rufous; head brownish-black, scabrous, long, sensibly narrowed behind, the occiput with a flat streak; antennæ rufous, the apex fuscous; prothorax long, narrow, rufous; feet rufous; abdomen rufous, the ventral segments having the posterior margin black; wings hyaline, veins fuscous; pterostigma long, narrow, trapezoid, occupying two areolets, yellow; subpterostigmatical areole almost one-half longer within, truncated; outer equal, broken; a series of five areoles beneath the pterostigma. (♂ and ♀.)

Length to tip of wings 16 millim. Alar expanse 23 millim.

Hab. California; Oregon (Willcox, Berlin Museum).

A female from Oregon has the dorsal base of the prothorax blackish-brown, with a trifid rufous spot; the colors of the male are not perfected.

2. Raph. oblita!

Raphidia oblita Hagen!

Fusco-aeneous; head scabrous, shorter, posteriorly suddenly compressed, occiput with a flat streak; antennæ with the basal article nigro-fuscous, second yellowish, the rest — ? prothorax short, rufo-fuscous, upon the dorsal middle posteriorly, a large, ovate, nigro-fuscous spot; feet rufo-fuscous; abdomen brassy-black, the ventral segments having the posterior margin yellow; wings hyaline, veins fulvous; pterostigma long (shorter than in *Raph. adnixa*), narrow, trapezoidal, occupying two areolets, yellow; subpterostigmatical areole almost one-half longer within, truncated, outwards equal, truncated; a series of five areolets beneath the pterostigma.

Length to tip of wings 14 millim. Alar expanse 21 millim.

Hab. California.

3. Raph. media!

Raphidia media Burm. Handb. II, 964, 3. Schneider! Monogr. 76, 4. (With the synonymy.)

Brownish-black; head obovate, the sides rounded, mouth yellow; neck short; vertex punctured, with a flat rufous streak; base of the antennæ yellow; prothorax black; feet testaceous, base of the anterior femora, and the whole of the posterior ones black; abdomen black; wings yellowish-hyaline, especially at base; veins fus-

cous; pterostigma trapezoidal, luteo-fuscous, occupying three areolets, with an internal hyaline spot; subpterostigmatical areolet exteriorly almost equal, interiorly one-half longer; five areolets beneath the pterostigma.

Length to tip of wings 19 millim. Alar expanse 27 millim.

Hab. North America (Knoch, Berlin Museum. One female). It is a common species in Europe.

† † Ocelli wanting. (*Inocellia* Schneider.)

4. Raph. inflata!

Raphidia inflata Hagen!

Fusco-aeneous; head quadrangular, the disk impressed, opaque; base of the mandibles, two broad approximate streaks, and three occipital spots each side, fulvous; prothorax short, conical, two arcuated, transverse rugæ; feet lurid, femora above, and the apex of the tibiæ fuscous; abdomen black, middle beneath yellow; posterior margin of the dorsal segments pointed with yellow; vagina black; wings hyaline, veins black; pterostigma short, almost oblong, the exterior side a little oblique, occupying one areolet, black; subpterostigmatical areolet equal within, longer without; a series of three areolets beneath the pterostigma.

Length to tip of wings 18 millim. Alar expanse 24 millim.

Hab. California.

Fam. VIII. HEMEROBINA.

Body usually cylindrical, narrow; wings large, numerously veined, the posterior ones with no anal space; tarsi with five articles; ocelli commonly absent.

Larva with a haustellate mouth.

ALEURONIA Fitch.

Covered with whitish powder; eyes reniform; antennæ moniliform; wings ciliated, longitudinal veins few, transverse ones almost absent.

1. A. westwoodii.

Aleuronia westwoodii Asa Fitch, Report I, 98.

Covered with whitish powder; black, head depressed anteriorly, antennæ with 28 articles, shorter than the body, moniliform, black,

not powdered; abdomen yellowish; feet pale; wings broad, the apex rounded, the anterior ones with six longitudinal veins, two of them forked; posterior ones with five longitudinal veins, the second and third joined together by a transverse vein; wings ciliated at the apex and posteriorly. (From the description of Dr. Fitch.)

Length to tip of wings $2\frac{1}{2}$ millim.

Hab. United States, in June and July.

CONIOPTERYX Haliday.

Powdered with whitish, eyes globose, antennæ moniliform; wings not ciliated, longitudinal veins few, some transverse veins; posterior wings of the male small.

C. vicina!

Coniopteryx vicina Hagen!

Covered with grayish powder; black, head rounded, antennæ –? feet lurid; wings broader at the apex, rounded, eight longitudinal veins, three and four forked, all joined together by a single transverse vein.

Length to tip of wings 4 millim. Alar expanse 6 millim.

Hab. Washington (Osten Sacken). The only specimen seen is mutilated.

SISYRA Burm.

Antennæ moniliform; subcosta and radius of the wings joined together at the apex; costal space of the base of the anterior wings with no recurrent vein; transverse veins almost absent.

Larva aquatic.

S. vicaria.

Hemerobius vicarius Walk. Catal. 297, 65.

Ferruginous, antennæ pale, abdomen obscurer, feet testaceous; wings fuscous, the anterior ones obscurer. (From the description of Walker.)

Length to tip of wings 5? millim. Alar expanse 9 millim.

Hab. Georgia (Abbot).

MEGALOMUS Rambur.

Antennæ moniliform; wings with the subcosta and radius joined together at the apex, the costal space of the anterior wings strongly dilated, with a forked, recurrent vein; transverse veins in a gradative series; the last article of the maxillary palpi subulate.

M. pictus!

Megalomus pictus Hagen!

Fuscous, hairy, face fusco-aeneous, palpi luteous; occiput fuscous, varied with black; antennæ luteous, the first article entirely, and the apex of the second, brownish-black; dorsum of the pro- and mesothorax blackish-fuscous; feet and abdomen luteous; wings broad, the apex obtuse, luteo-hyaline; the anterior wings with three gradate series of veins, the second series of which is fuscous; veins luteous, all pointed with fuscous, some larger points at the anterior and posterior margins, at the radius and at the external series of gradate veins; posterior wings yellow-hyaline, clouded with cinereous at the anterior margin and before the apex.

Length to tip of wings 8 millim. Alar expanse 15 millim.

Hab. Mexico (Deppe).

MICROMUS Rambur.

Antennæ moniliform; wings with the subcosta and radius joined together at the apex; costal space of the anterior wings narrowed at base, no recurrent vein, transverse series gradate; last article of the maxillary palpi not subulate.

* Wings excised at the apex.

1. M. flavicornis!

Hemerobius flavicornis Walk. Catal. 278, 4.

Luteous, ciliated; head and thorax luteous, pointed with fuscous, antennæ yellow; abdomen piceous, with two cylindrical appendages (male?); feet pale, with long pile, freckled with numerous fuscous points; apex of the wings excised, hamate, pilose, hyaline, a little clouded with fuscous; pterostigma yellow, fuscous at each side, apical margin of the anterior wings fuscescent; veins white, thickly pointed with brown; transverse veins of the costal

space forked; six sectors; the discoidal series of veins six-gradate, the four intermediate ones joined together; posterior wings with a fuscous point at the posterior margin.

Length to tip of wings 11 millim. Alar expanse 20 millim.

Hab. Washington (Osten Sacken); Georgia (Abbot).

2. M. hamatus.

Hemerobius hamatus Walk. Catal. 278, 5.

Testaceous; antennæ yellowish, feet pale; wings subhyaline, sprinkled with fuscous, the apex excised, subhamate. (From the description of Walker.) It is similar to the preceding, but the costal space is narrower.

Length to tip of wings 11 millim. Alar expanse 20 millim.

Hab. North America.

* * Apex of the wings rounded.

3. M. areolaris!

Micromus areolaris Hagen!

Yellowish; head rufous, antennæ black, thorax fuscous; feet yellow; apex of the wings ovate, yellow-hyaline, veins sparingly pilose, partly yellow, fuscous upon the disk and posterior margin, areoles of the last-named areas streaked with fuscous; two series of areolets, four-gradate, infracted; pterostigma yellow, each side fuscous; posterior wings yellow-hyaline; (reticulation irregular.)

Length to tip of wings 6 millim. Alar expanse 11 millim.

Hab. Florida, in March (Osten Sacken.)

4. M. insipidus!

Micromus insipidus Hagen!

Luteous; sparely pilose, head and thorax varied with fuscous, antennæ pale; abdomen luteous; feet pale, anterior tibiæ with two fuscous bands; wings hyaline, anterior ones obsoletely striated with fuscous; veins pale, with fuscous interruptions; four sectors; two series, 6 and 4 gradate, infracted.

Length to tip of wings 9 millim. Alar expanse 18 millim.

Hab. New York; Philadelphia.

5. M. sobrius!

Micromus sobrius Hagen!

Pale; sparely pilose; antennæ whitish-yellow, the apex obscurer;

head and thorax pale luteous; feet pale, white; wings whitish-hyaline, the anterior ones marmorated with fuscous; veins white, sparely interrupted with fuscous; gradate veins 6 and 4 brownish-black.

Length to tip of wings 9 millim. Alar expanse 17 millim.

Hab. Chicago (Osten Sacken).

HEMEROBIUS Linné.

Antennæ moniliform, wings with the subcosta and radius joined together at the apex; costal space of the anterior wings broader at base, with a recurrent, forked vein; transverse series gradate, broken; maxillary palpi with the last article subulate.

† One sector.

1. H. longicollis.

Hemerobius longicollis Walk. Catal. 281, 12.

Piceous, hairy; head ferruginous, antennæ luteous, a little longer than the body; prothorax much longer than broad, narrower anteriorly; tricarinated; feet testaceous; wings subcinereous, the anterior ones obsoletely clouded with fuscous; pterostigma lurid; transverse costal veins few, radius widely distant from the subcosta; one trifurcated sector; first gradate series interrupted, second almost absent; posterior wings short, pale. (From the description of Walker.)

Length to tip of wings 9 millim. Alar expanse 16 millim.

Hab. Georgia (Abbot). An irregular species; it seems to be allied to *Micromus areolaris*.

† † Two sectors.

2. H. amiculus.

Hemerobius amiculus Asa Fitch, Report I, 95.

Fuscous; antennæ yellowish, feet whitish; wings hyaline, irregularly clouded and spotted with fuscous; margin of the anterior wings pointed with black; veins fuscous pointed with black; gradate series banded with fuscous; posterior wings pale. (From the description of Dr. Fitch.)

Length to tip of wings 7? millim. Alar expanse 12 millim.

Hab. New York; Illinois; May to October (Asa Fitch). On peach trees and wild shrubs.

3. H. occidentalis.

Hemerobius occidentalis Asa Fitch, Report I, 95.

Blackish; antennæ shorter than the body, black; feet pale; wings hyaline, the areoles with two obscure parallel lines; margin obscure; veins stout, black, transverse veins almost as in the preceding species. (From the description of Dr. Fitch.)

Length to tip of wings 5? millim. Alar expanse 8 millim.

Hab. Henderson River, Illinois; October (Asa Fitch). (Washington, June. The antennæ of this specimen, ♂?, are longer than the body, and their basal third only, black, the remainder pale. Osten Sacken.)

Schioedte Berlin, Ent. Zeit. III, p. 143, reports *Hemerobius obscurus* Zett. Ins. Lapp. 1063, 12, from Greenland; I have not seen the specimens, nor is that species known to me.

4. H. delicatulus.

Hemerobius delicatulus Fitch, Report I, 96.

Obscure yellow; antennæ longer than the body, fuscous; feet pale; wings hyaline, veins fuscous, pointed obscurely; single gradate series banded with fuscous. (From the description of Dr. Fitch.)

Length to tip of wings 6? millim. Alar expanse 10 millim.

Hab. Illinois; October (Asa Fitch).

† † † Three sectors.

5. H. alternatus.

Hemerobius alternatus Fitch, Report I, 93.

White or yellowish; varied with fuscous, with fulvous pile; head in front and thorax each side with a blackish-fuscous stripe; abdomen whitish, each side with a longitudinal white stripe, which is margined above with a series of brown points, and below by a brown line; wings hyaline, iridescent, veins interrupted black and white; gradate series black, stout, marked with fuliginous; posterior wings pale, sparingly marked with black. (From the description of Dr. Fitch.)

Length to tip of wings 11? millim. Alar expanse 20 millim.

Hab. New York; June (Asa Fitch). Upon pine and hemlock bushes.

6. H. stigmaterus.

Hemerobius stigmaterus Fitch, Report I, 93.

Luteous; head and antennæ luteous, feet pale; thorax and abdomen fuscous; wings hyaline, anterior ones with black veins, which are banded with white; areoles fumose, with hyaline points; pterostigma fulvous; two gradate series, black. (From the description of Dr. Fitch.)

Var. Apex of the abdomen yellowish, or with a pale lateral streak.

Length to tip of wings 8—10 millim. Alar expanse 15—18 millim.

Hab. North America, Northern and Western States; common from March to October (Asa Fitch).

7. H. castaneae.

Hemerobius castaneae Fitch, Report I, 94.

Whitish; head with a spot beneath each eye, thorax each side with a stripe, and the abdomen with lateral spots, fuscous; wings hyaline, the margin a little dusky; veins whitish, interruptedly black, two gradate series black; a basal larger spot, another smaller, and the bases of the series of discoidal veins black.

The color of the veins often varies; they are sometimes either black, fuscous, or with fulvous interruptions; sometimes deep black, and the discoidal spots are confluent into a vitta. (From the description of Dr. Fitch.)

Length to tip of wings 10 millim. Alar expanse 18 millim.

Hab. Northern and Northwestern States, everywhere common, from April to October (Asa Fitch). Upon chestnut, walnut, and other trees.

8. H. tutatrix!

Hemerobius tutatrix Fitch, Report I, 94.

Yellow; head each side with an external fascia beneath the eyes; thorax each side with three spots, which sometimes are confluent, forming a stripe, fuscous; antennæ a little annulated with fuscous; feet yellowish; wings hyaline, veins whitish, interrupted with fuscous, V-shaped clouds of a fuscous color upon the areoles, having the angle on the fuscous interruptions, and the open side towards the apex of the wing; two series of transverse nervures, 7 and 6 gradate, black; a black point at base.

Length to tip of wings 9 millim. Alar expanse 16 millim.

Hab. New York, September (Asa Fitch), upon apple trees; Washington, June (Osten Sacken); California.

9. H. conjunctus.

Hemerobius conjunctus Fitch, Report I, 94.

Wings hyaline, the margin infuscated; veins white, interrupted with black, and banded; gradate veins, the two internal ones excepted, banded with fuscous, a black point at the base of the discoidal veins; posterior wings immaculate. The spots of the wings are almost as in *H. alternatus*, but the margin is immaculate. (From the description of Dr. Fitch.)

Length to tip of wings 8 millim. Alar expanse 14 millim.

Hab. New York, May (Asa Fitch), upon pine bushes.

10. H. pinidumus.

Hemerobius pinidumus Fitch, Report, I, 95.

Yellowish; sides of the thorax fuscous; wings hyaline, a little fumose, the margin with fuscous points; veins white, interrupted with fuscous; gradate series black, clouded with fuscous; three or four of the gradate veins forming a maculose band across the disk; similar to *H. tutatrix*, differing in the basal reticulation. (From the description of Dr. Fitch.)

Length to tip of wings 7 millim. Alar expanse 12 millim.

Hab. New York, May to July; common (Asa Fitch) upon pine bushes.

11. H. hyalinatus.

Hemerobius hyalinatus Fitch, Report, I, 95.

Similar to the preceding, perhaps a variety of it; wings more hyaline, veins finely interrupted with fuscous; gradate veins uncolored, not banded with fuscous; reticulation a little different. (From the description of Asa Fitch.)

Length to tip of wings 7 millim. Alar expanse 12 millim.

Hab. New York, May to July (Asa Fitch); upon pine bushes.

12. H. subanticus.

Hemerobius subanticus Walk. Catal. 282, 13.

Ferruginous; head testaceous in front; antennæ paler; feet tes-

taceous; wings sublurid, narrow, veins testaceous, dotted with fuscous, two interrupted, fuscous gradate series, which are clouded with fuscous; sectors of the radius 1 and 2 bifurcated, 3 unifurcated. (From the description of Walker.)

Length to tip of wings 6 millim. Alar expanse 11 millim.

Hab. St. John's Bluff, East Florida (Doubleday).

13. H. posticus.

Hemerobius posticus Walk. Catal. 283, 15.

Ferruginous; head paler; antennæ testaceous, longer than the body; wings subhyaline, the anterior ones clouded with fuscous, especially at the apex and posterior margin; veins pale testaceous, interrupted with fuscous; two complete series of gradate veinlets, which are fuscous, and clouded with fuscous; three bifurcate sectors; posterior wings with two complete series of gradate veinlets, the internal one of which is fuscous, and clouded with fuscous. (From the description of Walker.)

Length to tip of wings 9 millim. Alar expanse 14—16 millim.

Hab. Georgia (Abbot).

14. H. citrinus!

Hemerobius citrinus Hagen!

Yellow; occiput each side, and the sides of the prothorax, fuscous; feet yellow; wings yellow-hyaline, veins yellow, pointed with fuscous; gradate veins (6 and 5) yellow.

Length to tip of wings 10 millim. Alar expanse 18 millim.

Hab. North America (Knoch; Berlin Museum).

15. H. simulans.

Hemerobius simulans Walk. Catal. 285, 22.

Piceous; head ferruginous; antennæ piceous, ferruginous at base; prothorax short, broad; feet testaceous; wings cinereous, the anterior ones clouded with fuscous, veins black; two gradate series almost contiguous, banded with fuscous; sector 1 unifurcated, sector 2 bifurcated, sector 3 trifurcated. (From the description of Walker.)

Length to tip of wings 8 millim. Alar expanse 14 millim.

Hab. St. Martin's Falls, Albany River, Hudson's Bay (Barnston).

16. H. marginatus?

Hemerobius marginatus Walk. Catal. 286, 23.

Pale ochreous; wings white, with the transverse veins, and some clouds at the internal margin, fuscous; sectors 1 and 2 unifurcated, 3 quadrifurcated. (From the description of Walker.) I believe it to be different from the European insect of this name.

Length to tip of wings 10 millim. Alar expanse 19 millim.

Hab. Nova Scotia (Redman).

17. H. humuli?

Hemerobius humuli Walk. Catal. 286, 24.

Pale ochreous; antennæ annulated with fuscous and white; feet pale; wings hyaline, sparingly pointed with fuscous; sectors 1 and 2 unifurcated, 3 trifurcated. (From the description of Walker.) I believe it to be different from the European species of this name.

Length to tip of wings 8 millim. Alar expanse 14 millim.

Hab. Georgia (Abbot).

18. H. crispus?

Hemerobius crispus Walk. Catal. 288, 31.

Testaceous; sides of the thorax and the abdomen obscurer; wings opaline, narrow, the anterior ones spotted with fuscous, transverse veins fuscous; posterior wings immaculate; sectors 1 and 2 unifurcated, 3 trifurcated. (From the description of Walker.) I believe it to be different from the European species of this name.

Length to tip of wings 7 millim. Alar expanse 12 millim.

Hab. North America; Nova Scotia (Redman).

19. H. obliteratus.

Hemerobius obliteratus Walk. Catal. 289, 35.

Testaceous; antennæ longer than the body, fuscous, annulated with whitish, the apex fuscous; the basal article testaceous; feet pale testaceous; wings subhyaline, the anterior ones hardly clouded with fuscous; veins testaceous, interrupted with fuscous; gradate series two, broken, banded with fuscous; sectors 1 and 2 unifurcated, 3 trifurcated. (From the description of Walker.)

Length to tip of wings 7 millim. Alar expanse 12 millim.

Hab. Georgia (Abbot).

20. H. neglectus!

Hemerobius neglectus Hagen!

Yellow; head and sides of the prothorax fuscous; antennæ and feet pale yellow; wings luteo-fuscous, the anterior ones densely streaked with whitish-hyaline; veins luteous, pointed with black and fuscous; 6 and 5 of the gradate veins luteous.

Length to tip of wings 11 millim. Alar expanse 20 millim.

Hab. Mexico (Ehrenberg; Berlin Museum).

† † † † Four sectors.

21. H. longifrons.

Hemerobius longifrons Walk. Catal. 291, 40.

Testaceous, marked with fuscous; antennæ longer than the body, fuscous annulated with pale; abdomen piceous; feet pale testaceous; wings cinereous, anterior ones with three oblique, interrupted fasciæ, and marginal spots, black; veins pale testaceous, interrupted with black; gradate series two, broken; sector 3 unifurcated. (From the description of Walker.)

Length to tip of wings 10 millim. Alar expanse 18 millim.

Hab. St. Martin's Falls, Albany River, Hudson's Bay (Barnston).

POLYSTOECHOTES Burm.

Antennæ short, moniliform; subcosta and radius of the wings confluent at the apex; costal space of the anterior wings broader at base, with a recurrent vein, forked; a gradate series of several transverse veins; last article of the maxillary palpi truncated.

Larva perhaps aquatic.

1. P. punctatus!

Semblis punctata Fab.! Entom. Syst. II, 73, 4.—*Hemerobius nebulosus* Fab. Entom. Syst. Suppl. 202, 1—2.—*Hemerobius irroratus* Say, Long's Exped. II, 306, 1; Asa Fitch, Report, I, 92.—*Polystoechotes sticticus* Burm. Hand. II, 982, 1; Walk. Catal. 231, 1.—*Osmylus validus* Walk.! Catal. 233, 3.

Piceous, hairy; mouth testaceous; antennæ piceous, with the base testaceous; head and thorax clothed with gray hair; feet hairy, testaceous, the anterior ones annulated with fuscous, apex of the tarsal articles fuscous; abdomen piceous, beneath fuscous;

wings cinereous, subhyaline, the anterior ones marked with fuscous upon the margin; veins white, with fuscous interruptions; posterior wings immaculate; sector 1 seventeen-branched.

Length to tip of wings 28—38 millim. Alar expanse 52—76 millim.

Hab. North West Territory; Lake Erie, common (Say); North Red River (Kennicott); New York, July, rare (Asa Fitch); Philadelphia, Pennsylvania, Washington (Osten Sacken); California; Texas; Fort Steilacoom, Puget Sound (Dr. Suckley); Maryland (Uhler). I saw the specimen described by Fabricius in Bank's Museum.

2. P. vittatus.

Hemerobius vittatus Say, Long's Exped. II, 307, 2; Asa Fitch, Report, I, 92.

Pale yellow; head with a quadrangular black spot between the eyes; antennæ yellowish-red, the base and apex black; thorax greenish-white, the sides with a black vitta; wings hyaline, pointed with black; costal veins white, with black interruptions; pterostigma small, whitish; posterior wings almost immaculate, at the middle of the anterior margin a large orbicular spot, and another apical, smaller; feet black, base of the femora, an apical ring upon the posterior ones, and an apical ring upon the posterior tibiæ, pale; abdomen black, a small, dorsal, pale spot upon the segments. (From the description of Say.)

Length to tip of wings 30 millim. Alar expanse 55 millim.

Hab. Pennsylvania, New Jersey (Titian Peale, Say).

MANTISPA Illiger.

Antennæ short; prothorax elongated, cylindrical; anterior feet stout, raptatorial; wings narrow, subcosta and costa confluent at the middle of the anterior margin.

1. M. brunnea!

Mantispa brunnea Say, Long's Exped. II, 309; Amer. Entom. II, tab. xxv; Erichson, Germar's Zeitschrift, I, 161, 2; Westwood. Trans. Ent. Soc. Lond. ser. 2, I, 253, 2; Walk.! Catal. 214, 2.—*Mantispa varia* Erich.! Germar's Zeitschr. I, 161, 3; Westw. Trans. Ent. Soc. ser. 2, I, 253, 3; Walker! Catal. 214, 3; Hagen! Stettin. Ent. Zeit. XX, 406.

Color very variable; fuscous, varied with black and yellow;

head fuscous, a transverse streak at the base of the antennæ, and another, occipital, sometimes absent, black; antennæ fuscous, base and extreme apex yellowish; prothorax varying in robustness, anteriorly broadest, upon the middle transversely rugose, narrower between the anterior and posterior tubercles, fuscous; with a broad, transverse, yellow band behind the black anterior margin; or with a triangular yellow spot at base, before a black band; or with the middle also yellow; mesothorax fuscous, or fuscous margined with yellow; abdomen fuscous or yellow, base above and beneath black; anterior feet entirely rufo-fuscous, or with the femora black, tibiæ black inside, outside sometimes with a longitudinal black stripe; intermediate feet yellowish-red, with the femora obscure, or yellowish, the femora black, with the apex yellowish; tibiæ behind the base, banded with fuscous; tarsi sometimes (perhaps the other sex) with two broad lamelliform, yellowish lobes, which are rounded at the apex; (I have not seen this to be the case but in two specimens; types of *M. brunnea* Erichson, and of Uhler;) posterior feet the same color as the intermediate ones, with no lobes; wings fuscous, the posterior half hyaline.

Length to tip of wings 18—34 millim. Alar expanse 30—34 millim.

Hab. North West Territory (Say); N. Illinois (Kennicott); Philadelphia (Say); Georgia (Abbot); St. John's Bluff, E. Florida; Fort Steilacoom, Puget Sound; Mexico (Deppe); Central America.

I have seen many specimens; I believe the species of Say and Erichson not to be different; Mr. Say describes both sexes, but does not appear to have observed the remarkable lobes of the tarsi.

(The tarsal lobes are not characteristic of sex, but are found present in both males and females; the membranous character of these lobes, and their great delicacy seems to render them liable to disappear, by shrinking or accident; this probably accounts for their absence in most of the specimens observed by Dr. Hagen; in a specimen which I examined the one middle tarsus had the lobes beautifully apparent, while on the opposite tarsus only a vestige was present; on another tarsus only a white membrane was apparent; when well conditioned, the lobes are obvious upon both the middle and posterior tarsi. The male has robust, cylindrical, hairy anal appendages, superiorly, which will abundantly distinguish the sex. Uhler.)

2. M. interrupta!

Mantispa interrupta Say, Amer. Entomol. II, tab. xxv; Erichs. Germ. Zeits. I, 171, 21; Westw. Trans. Ent. Soc. ser. 2, I, 255, 21; Walk. Catal. 219, 21.

Yellowish; antennæ black, yellow at base; head yellow in front, with a black line upon the middle; posteriorly black, exteriorly yellow; a streak upon the middle, and a spot each side, yellow; prothorax long, slender, tuberculous, yellowish-fuscous; the apical and basal margin, and a longitudinal dorsal line, black; mesothorax fuscous, varied with yellow; abdomen fuscous (mutilated); feet yellowish, the anterior femora exteriorly and interiorly striated with fuscous, tibiæ and tarsi black; posterior femora interiorly at base with a fuscous line, intermediate tibiæ with a fuscous ring; wings hyaline, veins black, subcosta fuscous; pterostigma long, brownish-black.

Length to tip of wings 23 millim. Alar expanse 36 millim.

Hab. Philadelphia (Say, Uhler); Virginia (Uhler).

This species is very rare; I have seen only one specimen; the words of Mr. Say, "On the submargin is an irregular, quadrate, dark, fuscous spot, confluent with the carpus," do not agree with my specimen.

(The species varies in sometimes wanting the quadrate brown spot of the wings; the tarsal lobes are apparent in this species, in common with the preceding: I have seen a specimen in which the apical spot of the wings is absent. The abdomen is generally yellowish, with dorsal, triangular, black spots. Uhler.)

3. M. viridis.

Mantispa viridis Walk. Catal. 227, 47.

Green or yellow, with a reddish stripe each side, along the whole length of the body; face varied with rufous; antennæ reddish; prothorax long, slender, broader anteriorly; wings hyaline, veins pale, dotted with black. (From the description of Walker.)

Length to tip of wings 13 ? millim. Alar expanse 18 millim.

Hab. East Florida.

Walker, Catal. 215, 7, reports *M. prolixa*, from Georgia; I saw the specimen, but *M. prolixa* Erichson, is a different species. The locality of Mr. Walker's species is doubtful.

4. M. moesta!

Mantispa moesta Hagen!

Brownish-black; palpi fuscous; face fuscous, transversely rugose; front depressed, rufous, a spot between the antennæ, a black band posteriorly; antennæ fuscous; prothorax dilated anteriorly, luteous, margined with black; posteriorly narrower, cylindrical, transversely sulcated; abdomen black, apex of segments 1 and 2 margined with yellow; 3 and 4 polished at base, with very numerous red points; anterior feet black, first article of the tarsi exteriorly varied with yellow; posterior femora fuscous, with the apex yellow, tibiæ yellow, with an external fuscous spot; wings fuscous, shining; twelve discoidal areoles; a gradate vein upon areoles 6 and 7. (Female.)

Length to tip of wings 27 millim. Alar expanse 47 millim.

Hab. Tennessee (Saussure).

MELEOMA Fitch.

A genus not seen by me, allied to *Chrysopa*, but the bases of the antennæ are distant, and there is an intermediate frontal horn. (Asa Fitch.)

1. M. signoretii.

Meleoma signoretii Fitch, Report I, 82.

Yellowish-green, pale, sparingly pilose; between the antennæ a cylindrical horn, which is longer than the basal joint of the antennæ, deflexed anteriorly into a lamina, upon the middle of which is a black tooth; face each side with a fuscous spot, antennæ pale fuscous, the two basal articles green, the first elongated, thicker; base of the prothorax elevated; feet whitish, tarsi yellowish, with the apex black; apex of the wings a little angulated, hyaline, pterostigma a little opaque; veins whitish, gradate veins, and transverse ones of the interior side of the radius, black. (From the description of Dr. Fitch.)

Length to tip of wings 15? millim. Alar expanse 27 millim.

Hab. Mt. Antonio, Rupert, Vermont, July (Asa Fitch).

2. M. longicornis.

Osmylus longicornis Walk. Catal. 235, 8.

Testaceous, somewhat marked with fuscous; antennæ longer

than the wings, straw-colored, slender, a little pubescent; feet straw-colored; wings hyaline, long, narrow; the anterior ones with whitish veins, which are interrupted with fuscous; veins of the posterior wings whitish; fuscous points between the radius and subcosta. (From the description of Walker.)

Length to tip of wings 22 millim. Alar expanse 40 millim.

Hab. Georgia (Abbot).

Does it belong to this genus? I saw the specimen, and noted "that it belonged to *Chrysopa*."

CHRYSOPA Leach.

Antennæ setiform, long; subcosta and radius of the wings not conjoined at the apex; the costal space of the anterior wings narrow at base, no recurrent vein; transverse veins in gradate, continuous series; the last article of the maxillary palpi compressed at the apex, narrowed.

† Second article of the antennæ with a black ring.

1. Ch. oculata!

Chrysopa oculata Say, Journ. Acad. Philad. VIII, 45; Walk. Catal. 260, 56.—*Chrysopa euryptera* Burm. Handb. II, 980, 7; Schneider, Mon. Chrys. 129, 39, tab. xlv.—*Chrysopa omikron* Fitch, Report I, 85.

Greenish-yellow; antennæ yellowish, the apex obscure, the second article annulated with black, the first joint with a red, dorsal spot or annulus; head yellow, bases of the antennæ surrounded with black rings, above upon the middle interrupted with sanguineous; sides of the cheeks with a black streak; occiput with four black points, which are sometimes confluent into two lines; the anterior spots often conjoined with the rings around the antennæ, each side behind the eyes with a black point; prothorax each side with three black points, forming two intermediate series, and two more laterally, also black; wings hyaline, transverse veins of the anterior ones almost entirely, or in part black.

Length to tip of wings 16—18 millim. Alar expanse 26—30 millim.

Hab. St. Martin's Falls, Albany River, Hudson's Bay (Barnston); United States (Say), extremely common; common in June (Asa Fitch); I have seen many specimens; Washington (Osten

Sacken); New York; Savannah, Dalton, Georgia; Pennsylvania; Virginia (Osten Sacken); Illinois (Kennicott); Maryland (Uhler); New Orleans (Pfeiffer); Tennessee (Saussure).

2. Ch. illepida!

Chrysopa illepida Fitch, Report I, 84.

Very much like the preceding species, but the four occipital spots are conjoined in two lines; the anterior wings with the transverse veins only of the costa, at their base and apex, the base of the second sector, and the gradate veins, black.

Same size as the preceding species.

Hab. New York; Illinois, June (Asa Fitch); perhaps a variety of the preceding.

3. Ch. albicornis.

Chrysopa albicornis Fitch, Report I, 84.

Very much like *Ch. oculata*, the four occipital black points conjoined in two lines; the basal article of the antennæ annulated with sanguineous, the transverse veinlets of all the wings entirely, or in part black. (From the description of Dr. Fitch.)

Same size as the preceding.

Hab. Mississippi, April (Asa Fitch); perhaps a variety.

4. Ch. chlorophana!

Chrysopa chlorophana Burm. Handb. II, 979, 1; Schneid.! Monog. Chrys. 127, 32, tab. xliv.—*Chrysopa xanthocephala* Fitch, Report I, 85.

Very much like *Ch. illepida*, head having the same picturation, but differs in the wings being a little viridescent, the apex more rounded, the pterostigma obscurer, and the ciliæ of the veins longer.

Same size as preceding.

Hab. New York; Lake Michigan, June (Asa Fitch).

Its appearance is different; but it is difficult to be separated by distinct marks. Further experience will decide whether the species of Dr. Fitch can be justly separated from it.

5. Ch. fulvibucca.

Chrysopa fulvibucca Fitch, Report I, 86.

Very much like *Ch. oculata*, but differs in wanting the external black streaks of the cheeks; points of the prothorax variable. (From the description of Dr. Fitch.)

Same size as preceding.

Hab. New York, July and August. Perhaps a variety.

6. Ch. transmarina!

Chrysopa transmarina Hagen!—*Ch. chlorophana* Walker! Catal. 259, 55.

Similar to *Ch. chlorophana*, but differs by wanting the two occipital middle points; two well-defined spots at the eyes anteriorly and two posteriorly; wings densely and longly ciliated, the transverse veins entirely green, the costal ones hardly black at base.

Length to tip of wings 13 millim. Alar expanse 23 millim.

Hab. La Chine, near Montreal (Barnston); C. St. John, Newfoundland; Nova Scotia (Redman).

7. Ch. mississippiensis.

Chrysopa mississippiensis Fitch, Report I, 86.

Picturation of the head very much like that of the preceding species, but it differs in size; the wings are rounded at the apex, all the transverse veins or a part of them black. (From the description of Dr. Fitch.)

Alar expanse 33 millim.

Hab. Jackson, Mississippi, in April (Asa Fitch).

8. Ch. chi.

Chrysopa chi Fitch, Report I, 87.

Antennæ pale, the apex obscurer; at the base of the antennæ an *x*-shaped spot, two lateral spots each side, and an intermediate point black; occiput with four black points in a transverse series; prothorax and mesothorax with four black points, and a point at the base of the anterior wings; abdomen black, the apex pale; transverse veins black, those of the costal middle green; posterior wings with the transverse veins black, base of the first sector black, the second sector black, green upon the middle. (From the description of Dr. Fitch.)

Length to tip of wings 19? millim. Alar expanse 34 millim.

Hab. New York, June (Asa Fitch).

9. Ch. ypsilon!

Chrysopa ypsilon Fitch, Report I, 87.

Greenish-yellow, pale; antennæ pale, the apex obscurer, the basal article beneath with an apical black point, the second article with

a black ring; between the antennæ is a black Y; a series of semilunar streaks at the base of the antennæ, a quadrangular spot before and a streak upon the sides of the cheeks, black; occiput with four black points in a transverse series; prothorax with four quadrangular black spots, mesothorax with two, and a spot at the bases of the anterior wings, black; abdomen obscure green, the segments with two dorsal, medial, fuscous points; wings hyaline, transverse veins black, green on the middle.

Length to tip of wings 16 millim. Alar expanse 29 millim.

Hab. New York, May, June (Asa Fitch); Washington (Osten Sacken).

At first sight it resembles the preceding; is it different?

10. Ch. latipennis!

Chrysopa latipennis Schneid. Monog. Chrys. 118, 34, tab. xl; Walk. Catal. 259, 54.—*Chrysopa bipunctata* Fitch, Report I, 87.

Yellowish-green; apex of the antennæ obscurer, the second article with a black ring; face at the base of the antennæ with a semilunar, short streak, a streak at the sides of the cheeks, and a point anteriorly, black; occiput with two black points; thorax and abdomen green, one-colored; wings broader, the apex rounded, transverse veins of the costal space black at their bases, black all over in the posterior wings.

Length to tip of wings 19 millim. Alar expanse 34 millim.

Hab. Pennsylvania (Zimmerman); St. Martin's Falls, Albany River, Hudson's Bay (Barnston); New York, June (Asa Fitch).

† † Second article of the antennæ of the same color as the rest.

* Antennæ partly black.

11. Ch. nigricornis!

Chrysopa nigricornis Burm. Handb. II, 980, 6; Schneid.! Monog. Chrysop. 126, 37, tab. xliii; Walk. Catal. 259, 50.—*Chrysopa colon* Fitch, Report I, 88.

Pale yellow; antennæ yellowish, black at base, the first article whitish; face with a black streak at sides upon the cheeks; prothorax each side anteriorly with a black point; body pale yellow; wings hyaline, transverse costal veins, gradate veins entirely and the second sector at base, black.

Length to tip of wings 18 millim. Alar expanse 38 millim.

Hab. Carolina (Zimmerman); New York, June (Asa Fitch); collection of Hagen.

12. Ch. ampla!

Chrysopa ampla Walk. Catal. 268, 72.

Luteous; antennæ longer than the wings, the basal article large, inflated, articles 3—8 within, lineated with black; prothorax broad, narrow in front; mesothorax spotted with fuscous above; wings hyaline, veins white, stigma small, fuscous; anterior wings with fuscous veins at base, two basal, costal ones, the last one of the cubitus, the second one of the first sector, and some of those of the costa at their apex, blackish-fuscous.

Length to tip of wings 27 millim. Alar expanse 48 millim.

Hab. Georgia (Abbot); Mexico.

Another specimen from Mexico is only 21 millim. long, but it is hardly different.

13. Ch. lineaticornis!

Chrysopa lineaticornis Fitch, Report I, 91.—*Chrysopa puncticornis* Fitch, Report I, 92.

Pale green; antennæ longer than the wings, black at base, the basal article pale, inflated, above lineated with black; head spotted with fuscous anteriorly; prothorax exteriorly margined with fuscous; wings hyaline, all the transverse veins black.

Length to tip of wings 17 millim. Alar expanse 31 millim.

Hab. New York, July (Asa Fitch); North America (Vienna Museum).

Chrysopa puncticornis is, very probably, nothing more than a variety.

14. Ch. cubana!

Chrysopa cubana Hagen!

Bright green; antennæ of the length of the wings, black, the basal article bright green, above with a broad, black streak; wings hyaline, transverse veins all black.

Length to tip of wings 12 millim. Alar expanse 20 millim.

Hab. Cuba, in March (Osten Sacken); Alleghany Mountains, Virginia (Osten Sacken).

15. Ch. lateralis.

Hemerobius lateralis Guér. Iconogr. Règn. Anim. Ins. p. 388. Schneid. Monog. Chrys. 162, 6.—*Chrysopa lateralis* Walk. Catal. 274, 86.

Bright green; antennæ longer than the body, blackish-fuscous, the basal article rufous; head anteriorly at the margins of the eyes, and sides of the prothorax with a line, rufous; veins of the wings green; feet green, tarsi fulvous. (From the description of Guérin.)

Length to tip of wings 17 millim. Alar expanse 30 millim.

Hab. Vera Cruz (Sauley).

16. Ch. conformis!

Chrysopa conformis Walk. Catal. 269, 74.

Testaceous; antennæ longer than the wings, blackish at base; feet pale; abdomen testaceous; wings hyaline, pterostigma testaceous, veins green, some of them black. (From the description of Walker.)

Length to tip of wings 17 millim. Alar expanse 30 millim.

Hab. Jamaica (Gosse); Cuba; St. Thomas; Mexico (Deppe).

Perhaps a specimen from Jamaica (Cuming; Vienna Museum), belongs here; but the antennæ are destroyed; the basal article i testaceous; the prothorax is margined anteriorly with rufous. Does it possibly belong to *Chrysopa transversa?*

17. Ch. pavida!

Chrysopa pavida Hagen!

Pale, whitish-yellow; occiput truncated behind; antennæ long, black; the basal article large, yellow, above with a longitudinal rufous spot; the second and third articles yellowish; prothorax flat, quadrangular, anteriorly obliquely truncated, the sides narrowly red; wings large, hyaline, pterostigma yellow; veins yellowish; anterior wings with the middle of the costal veins or the whole of them, black; the apex of the second sector, the gradate veins (10 and 11) almost entirely, apices of the rest of the transverse veins, and the marginal forks entirely, black; hind wings with the apex of the second sector, and vein of the posterior margin, black.

Length to tip of wings 22 millim. Alar expanse 41 millim.

Hab. Cordova, Mexico (Saussure, Deppe); South Carolina (Zimmerman).

May this not be *Hemerobius lateralis* Guér. Icon. Règn. Anim. p. 388?

18. Ch. explorata!

Chrysopa explorata Hagen!

Yellowish; face with a large, quadrangular spot, occiput with a Y-shaped streak and spot, red; antennæ yellowish, fuscous at base; the first article yellow, with the apex above, red; prothorax broad, obliquely truncated in front; anterior margin black; wings hyaline, narrow, pterostigma yellow, interiorly with a red spot; transverse veins of the anterior wings almost all blackish-fuscous; gradate veins 5 and 5.

Length to tip of wings 13 millim. Alar expanse 23 millim.

Hab. Cordova, Mexico (Saussure).

* * Antennæ immaculate; veins varied with black.

19. Ch. insularis.

Chrysopa insularis Walk. Catal. 269, 73.

Testaceous, beneath paler; antennæ testaceous, much longer than the wings; head testaceous, mouth rufous, a vertical rufous streak; prothorax long, conical; segments of the abdomen fuscous posteriorly; wings hyaline, veins green, some of them black; pterostigma small, fuscous; anterior wings with a discoidal fuscous spot, internal gradate veins black. (From the description of Walker.)

Length to tip of wings 20 millim. Alar expanse 36 millim.

Hab. Jamaica (Gosse).

20. Ch. transversa.

Chrysopa transversa Walk. Catal. 255, 46.

Yellow; antennæ shorter than the wings, yellow, pubescent, the base paler; head yellow; face with a spot at the base of the antennæ, and the lateral margin, rufous; palpi partly black; prothorax broad, short, narrower anteriorly, the lateral margins rufous; feet pale green; wings hyaline, veins green, transverse ones almost all black; pterostigma pale green; areoles rather few. (From the description of Walker.)

Length to tip of wings — ? millim. Alar expanse 22 millim.

Hab. Jamaica (Gosse).

21. Ch. collaris.

Chrysopa collaris Schneid. Monog. Chrys. 80, 9, tab. xv. Walk. Catal. 245, 19.

Yellowish-green; a red streak each side, upon the cheeks, at the eyes, another upon the lateral margin of the clypeus and labrum; a red point each side upon the occiput near the eyes; prothorax a little broader than long, sides bright ferruginous; antennæ shorter than the wings, paler at base; anterior wings with the gradate veins and all the subcubital ones, base and apex of the costal ones, base of the second sector, the first sector, and some cubital ones partly, black; posterior wings with the costal veins black. (From the description of Schneider.)

Length to tip of wings 16 millim. Alar expanse 29 millim.

Hab. Island of St. Thomas.

Perhaps it is not distinct from *Ch. transversa.*

22. Ch. thoracica!

Chrysopa thoracica Walk.! Catal. 243, 15.

Green, striped with yellow, robust; antennæ (absent from my specimen) stout, much shorter than the wings, testaceous, yellow at base; face pale, a transverse rufous streak each side at the antennæ; palpi dusky; prothorax broad, short, a dorsal, longitudinal, yellow stripe upon the middle; abdomen with a similarly placed yellow stripe; feet pale green; wings narrow hyaline, veins of the costa, transverse ones of the second sector and gradate ones, black; pterostigma pale green.

Length to tip of wings 16 millim. Alar expanse 29 millim.

Hab. Havana (collection of Hagen); St. Domingo (Pierret).

23. Ch. quadripunctata!

Chrysopa quadripunctata Burm.! Handb. II, 980, 5. Schneid.! Monog. Chrys. 84, 12, tab. xviii. Walk. Catal. 246, 22.—*Chrysopa sichelii* Fitch, Report I, 89.

Pale yellowish-green; thorax and abdomen with a middle orange stripe; head pale, with a yellow spot above; sides of the face, a little between the antennæ, and each side posteriorly, at the eyes, orange; antennæ whitish, palpi whitish, with the apex fuscous; prothorax pale yellow, each side with three orange points; mesothorax with an orange point each side anteriorly; feet pale; wings hyaline, transverse veins almost all black.

Length to tip of wings 18 millim. Alar expanse 32 millim.

Hab. Carolina (Zimmerman); Pennsylvania; New York, August (Asa Fitch).

The other locality cited by Mr. Walker does not belong to this species.

24 Ch. virginica.

Chrysopa virginica Fitch, Report I, 91.

Yellowish-green, immaculate; prothorax each side anteriorly with a black point; wings hyaline, veins green, transverse veins of the second sector fuscous at base, first gradate vein of the external series black, clouded with fuscous; pterostigma with a fuscous point, which is larger in the posterior wings; basal areole quadrangular. (Is it irregular?) (From the description of Dr. Fitch.)

Length to tip of wings 19 millim. Alar expanse 35 millim.

Hab. Cartersville, Virginia (Asa Fitch).

25. Ch. sulphurea.

Chrysopa sulphurea Fitch, Report I, 89.

Yellowish-sulphureous; a subocular orange point; prothorax each side anteriorly, and the basal segments of the abdomen each side, with an orange point; antennæ and feet whitish; apex of the wings rounded, of the posterior ones slightly angulated, veins whitish, transverse veins with the base and apex of almost all of them, and the gradate veins, black. (From the description of Dr. Fitch.)

26. Ch. rufilabris!

Chrysopa rufilabris Burm. Handb. II, 979, 2. Schneid. Monog. Chrys. 78, 8, tab. xiv. Walk. Catal. 245, 18.—*Chrysopa novaeboracensis* Fitch, Report I, 90.

Pale green, with a yellowish stripe in the middle; antennæ whitish, the apex obscurer; face with a lateral streak and the mouth red; palpi luteous, the apex and exteriorly fuscous; occiput each side with a rufous point; prothorax often each side with a black point; feet pale; wings hyaline, the apex angulated, transverse veins almost all black, green in the middle.

Length to tip of wings 15 millim. Alar expanse 27 millim.

Hab. Pennsylvania; New York, common in June and July (Asa Fitch); Savannah, Georgia; Mexico.

27. Ch. interrupta!

Chrysopa interrupta Schneid. Monog. Chrys. 76, 16, tab. xii. Walk. Catal. 242, 12.—*Chrysopa tabida* Fitch, Report I, 92.

Pale green, almost white, immaculate; wings narrow, gradate and subcubital veins black, transverse almost all black, with white middles.

Length to tip of wings 14 millim. Alar expanse 26 millim.

Hab. Pennsylvania; New York, August (Asa Fitch).

28. Ch. emuncta.

Chrysopa emuncta Fitch, Report I, 88.

Pale yellow; head each side with a transverse, small, subocular line, and an intermediate one black; prothorax anteriorly with a black point each side; apex of the wings rounded, bases of the transverse costal veins, and the base and apex of the second sector black; palpi exteriorly black. (From the description of Dr. Fitch.)

Length to tip of wings 19 millim. Alar expanse 34 millim.

Hab. New York, August (Asa Fitch).

29. Ch. attenuata!

Chrysopa attenuata Walk. Catal. 242, 14.

Yellow, very slender; sides of the head anteriorly rufous; palpi varied with rufous; antennæ yellowish; prothorax narrow, the sides anteriorly rufescent; feet pale; wings hyaline, veins green, transverse costal veins, the second sector and gradate veins obscurer.

Length to tip of wings 11 millim. Alar expanse 20 millim.

Hab. St. John's Bluff, East Florida (Doubleday); Berkeley Springs, Virginia (Osten Sacken).

30. Ch. repleta.

Chrysopa repleta Walk. Catal. 244, 17.

Testaceous; apex of the antennæ a little obscurer; prothorax long, narrow in front; segments of the abdomen each side with a fuscous spot; feet pale; wings hyaline; all the transverse veins of the anterior wings, and some of those of the posterior wings, partly tinged with fuscous. (From the description of Walker.)

Length to tip of wings 12 millim. Alar expanse 22 millim.

Hab. Georgia (Abbot).

* * * Antennæ immaculate; veins of the wings green.

31. Ch. harrisii.

Chrysopa harrisii Fitch, Report I, 90.—*Chrysopa perla* Harris, Ins. New England, 215.

Very much like *Ch. novaeboracensis*, but a little broader; the veins all green. (From the description of Dr. Fitch.)

Length to tip of wings 15 millim. Alar expanse 28 millim.

Hab. New York, in July and August (Asa Fitch).

32. Ch. externa!

Chrysopa externa Hagen!

Greenish-yellow; thorax and abdomen with a middle, yellow vitta; the mouth anteriorly and the sides sanguineous; antennæ fulvous, yellowish at base; wings narrow, acuminate, fimbriated with green; all the veins green; the divisory-veinlet of the third cubital areole not reaching the first transverse veinlet of the first radial sector.

Length to tip of wings 14 millim. Alar expanse 26 millim.

Hab. Washington (Osten Sacken); Mexico; California.

May not this be *Ch. harrisii?* the wings, however, are narrower. The species has the divisory veinlet not reaching the first transverse veinlet, or rather not clearly exceeding it; and it is very much like *Ch. vulgaris*, of Europe; but differs by the wings being narrower, and more acuminate. *Ch. acuta*, of the Berlin Museum, is perhaps this species (from Brazil, Surinam, Mexico); but it differs in having fewer gradate veins.

33. Ch. robertsonii.

Chrysopa robertsonii Fitch, Report I, 88.

Pale green, with a pale dorsal stripe; head sulphureous, a short, black line each side at the eyes; antennæ yellowish, the basal article whitish; wings rounded at the apex, pterostigma green, veins all green. (From the description of Dr. Fitch.)

Length to tip of wings 15 millim. Alar expanse 26 millim.

Hab. Tullehassie, Creek Indian Territory (Robertson).

34. Ch. plorabunda.

Chrysopa plorabunda Fitch, Report I, 88.

Pale green, with a yellow dorsal stripe; head yellow, with a small black line at the eyes; antennæ whitish, with the apex yel-

lowish; feet green-white, tarsi yellowish; apex of the wings rounded, the posterior ones with the apex a little acuminate.

A variety has a reddish point each side of the head. (From the description of Dr. Fitch.)

Length to tip of wings 14 millim. Alar expanse 25 millim.

Hab. New York, Illinois, September and October, common (Asa Fitch).

35. Ch. pseudographa.

Chrysopa pseudographa Fitch, Report I, 89.

Very much like the preceding, stramineous; head yellow, face each side with a small black line; antennæ, feet, and veins of the wings whitish; apex of the wings rounded; abdomen with a narrow, dorsal, white line, and the segments each side with an apical, yellowish spot.

Var. Apex of the segments with a yellowish fascia. (From the description of Dr. Fitch.)

Length to tip of wings 14 millim. Alar expanse 25 millim.

Hab. Northern Illinois, October (Asa Fitch).

36. Ch. flava!

Hemerobius flavus Scopol. Ent. Carn. 270, 707.—*Chrysopa vittata* Wesm.! Bullet. Acad. Brux. VIII, 211, 7 (partly); Schneid.! Monog. Chrys. 65, 1, tab. vii.—*Chrysopa alba* Brauer! Monog. No. 5; Burm.! Handb. II, 981, 13.—*Chrysopa subfalcata* Steph.! Illustr. VI, 105, 13.

Entirely whitish-green; basal article of the antennæ thick, elongated; wings acuminate, the costal margin of the anterior ones broadly emarginated; veins white, a few of the transverse veins at base a little blackish.

Length to tip of wings 26 millim. Alar expanse 46 millim.

Hab. Philadelphia (collection of Hagen); Europe; Asia.

37. Ch. innovata!

Chrysopa innovata Hagen!

Pale yellow; maxillary palpi with an external black streak upon the articles; face with a black streak and spot on both sides; antennæ pale yellow (partly destroyed), the first articles, long, narrow, cylindrical, hardly thicker than the following ones; front tuberculous between the antennæ; vertex citron-colored; prothorax subelongate, narrower anteriorly, each side anteriorly with a black point; feet pale yellow, nails black; abdomen yellow; wings

long, the apex elliptical; veins and their fimbriæ pale yellow; base of the costal veins, the first and second sector, some of the cubital at the apex and sometimes at the base, and the gradate veins (12 and 10) all black.

Length to tip of wings 23 millim. Alar expanse 41 millim.

Hab. Mexico (Deppe; Berlin Museum).

ACANTHACLISIS Rambur.

Antennæ short, stout, the apex thickened; labial palpi longer than the maxillary; body stout, abdomen long, the apex forcipated in the males; feet stout; spurs infracted; base of the nails dilated; wings long, narrow, densely veined; the male having a tubercle at base of posterior wings.

1. A. americana.

Myrmeleon americanum Drury, Ins. I, 111, 4; tab. xlvi, fig. 4. Burm. Handb. II, 996, 17. Walk. Catal. 317, 31.—*Acanthaclisis americana* Ramb. Neuropt. 380, 4.

Gray, clothed with gray hairs; head with a black stripe in the middle, face gray; antennæ black; thorax yellow-gray, with a stripe in the middle and a lateral one each side black, clothed with long gray pile; abdomen fuscous, the sides obscurer; apex of the abdomen of the male with short, straight, forcipated cerci; feet black, with gray hair; wings grayish-hyaline, densely pointed with fuscous; costal space fuscescent in the middle, biareolate. (From the figure and description of Drury.)

"Grayish-fuscous, front and two dorsal stripes rosy-gray; feet annulated with flesh-color; veins of the wings hyaline, alternately rosy and fuscous, wings with fuscous and pearly spots." (Burm.)

Length to tip of wings 71 millim. Alar expanse 126 millim.

Hab. New York (Drury) ♂; South Carolina (Zimmerman) ♀.

I have never seen it; the specimen of Burmeister is larger, the wings spread 96 millim. Is it different?

2. A. fallax!

Myrmeleon fallax Ramb.! Neuropt. 385, 1. Walk. Catal. 329, 45.—*Myrmeleon impostor* Walk.! Catal. 324, 41.—*Myrmeleon senilis* Klug! Berlin Museum.

Lurid, with gray villosity, beneath yellowish; face, palpi, and

base of the antennæ beneath yellowish; antennæ lurid, annulated with fuscous; vertex varied with fulvous and fuscous, a middle longitudinal line, and each side with a transverse streak, fulvous; occiput with two approximated fuscous lines; prothorax lurid, each side with three longitudinal fuscous stripes, the intermediate ones being less clear; the middle ones approximated, with a whitish line, which is thicker anteriorly, separating them; thorax lurid, streaked with fuscous, and with a dorsal whitish, middle line; feet pale, apex of the femora exteriorly fuscous, tibiæ, especially the anterior ones, annulated with fuscous; nails black; abdomen lurid, above with three fuscous streaks; thorax and feet with long and dense gray villosity; appendages of the male cylindrical, short, almost straight, above with black pile; wings long, narrow, the apex acuminated, the apex of the posterior ones a little emarginated, hyaline, with pearly spots; veins alternated with white and fuscous spots; radius punctated; the space between the median nervure and the subcosta sometimes spotted with fuscous; pterostigma small, white; transverse veins often bifid at the apex of the costal space.

Length to tip of wings 70 millim. Alar expanse 120 millim.

Hab. Mexico (Coffin); Cuba; Columbia; Guiana; Brazil.

It may perhaps constitute a new subgenus.

3. A. congener!

Acanthaclisis congener Hagen!

Black, clothed with gray hair; face, palpi, and base of the antennæ beneath, yellowish-white; antennæ black, the apex with narrow whitish rings; vertex black with two transverse stripes, the posterior one interrupted in the middle, and two points posterior to the bands, yellow, the surface with white hair; prothorax each side with a maculose stripe, which is double anteriorly, fulvous; posterior margin fulvous, black in the middle; mesothorax spotted with yellow; abdomen black, with gray pile, the posterior margins of the apical segments narrowly fulvous; feet fuscous, with gray hair, tibiæ yellowish, annulated with fuscous, tarsi black; wings hyaline, a little acuminate, veins yellow, with fuscous interruptions, pterostigma small, black, margined with yellow; subcosta and median nervule distinctly punctate; the costal space with one series of areoles. (Female.)

Length to tip of wings 43 millim. Alar expanse 72 millim.

Hab. Pecos River, Western Texas, July (Capt. Pope).

MYRMELEON Linné.

Antennæ short, robust, the apex thickened; body elongated, slender; feet long, slender; spurs straight or a little incurved; base of the nails not dilated; wings long, narrow, densely veined.

† Apex of the wings with a broad fuscous band.

1. M. gratus!

Formicaleo grata Say, Journ. Acad. Philad. VIII, 45, 2.—*Myrmeleon gratus* Walk.! Catal. 392, 157.—*Myrmeleon roseipennis* Burm.! Handb. II, 995, 13; Ramb.! Neuropt. 408, 38, tab. xii, fig. 2.

Black; margin of the labium, a transverse stripe upon the face and the occiput yellow; antennæ long, the apex hardly thickened; labial palpi short, black, the last article longer, fusiform; prothorax black, a middle line, broader at base and apex, white; abdomen fuscous; feet slender, long, rufo-fuscous, base of the femora pale; posterior tibiæ pale, with the apex fuscous; spurs long, straight, as long as the two basal articles of the tarsi; tarsi pale, with the apex fuscous; wings large, hyaline, the apex rosy, interior to which is a large, trifarious, fuscous spot; anterior wings with a spot at the middle of the posterior margin, and a series of points at the submedian nervure, fuscous; median and submedian nervures yellow, interrupted with fuscous.

Length to tip of wings 52 millim. Alar expanse 94 millim.

Hab. Indiana; St. Louis; Philadelphia; Mississippi (Edwards).

† † Wings with ocellate fuscous spots.

2. M. obsoletus!

Formicaleo obsoleta Say, Jour. Acad. Philad. VIII, 44, 1.—*Myrmeleon ocellatus* Burm.! Handb. II, 995, 12; Walk. Catal. 401, 172.—*Myrmeleon nigrocinctus* Ramb.! Neuropt. 398, 20; Walk.! Catal. 361, 101.

Luteous; face with a transverse, broad, fuscous fascia; antennæ long, the apex clavate, luteous, the base and apex black; labial palpi short, luteous, the last article longer, fusiform; prothorax elongated, narrower anteriorly, luteous, a little granulated with black; meso- and metathorax with a broad, dorsal, fuscous stripe; at each side a broad black stripe; abdomen black, a luteous, dorsal band upon the middle of each segment; feet elongated, very slender, black; base of the anterior femora, and apex of the tibiæ brown;

posterior femora with a luteous band before the apex, tibiæ luteous, with the base and apex black, tarsi luteous, obscurer at the apex; spurs as long as the two basal articles of the tarsi, luteous; wings hyaline, beautifully spotted with fuscous; the anterior ones with an ocellate spot at the middle of the posterior margin, a double spot at the pterostigma, an apical interrupted series, and some points at the median nervure, fuscous; posterior wings with a larger, orbicular spot before the pterostigma, and some apical spots, also fuscous.

Length to tip of wings 34 millim. Alar expanse 62 millim.

Hab. United States, not rare (Say); New York; St. Louis; Carolina (Cabanis); Alabama (Gosse); Maryland (Uhler).

Very much like *M. pantherinus* Fab. (*ocellatus* Borkhausen), from Europe, but a different and most beautiful species. (Gosse (Letters from Alabama) figures this species on p. 248—Uhler.)

† † † Wings not spotted, but hyaline or sprinkled with fuscous.

* Costal space with a double series of areoles.

‡ No spurs.

3. M. abdominalis!

Myrmeleon abdominalis Say, Godman's West. Quart. Report, II, 163.—*Myrmeleon irroratus* Burm.! Handb. II, 995, 11.—*Myrmeleon conspersus* Ramb.! Neuropt. 387, 3; Walk.! Catal. 329, 47.—*M. talpinus* Klug. Berlin Museum.

Fuscous; face pale, with a broad, brownish-black band upon the middle, which is emarginated anteriorly; vertex black, a transverse, pale line above at the base of the antennæ; antennæ long, stout, not clavate, black; palpi equal, luteo-fuscous; thorax fuscous, obscurely and interruptedly lineated with pale; prothorax short; abdomen long, slender, longer than the wings, the apex forcipated, fuscous, hirsute; two longitudinal, dorsal lines, which are sometimes partly confluent, pale; feet pale, densely sprinkled with black, apex of the tibiæ, and apex of the tarsal articulations black; tibiæ armed with long, black spines, no spurs; wings short, broader before the apex, a little fumose, subhyaline, veins fuscous, interrupted with white, the anterior wings closely sprinkled with fuscous, especially at the median and submedian nerves; abdomen of the female shorter than the wings; fuscous, the segments with middle and apical yellow points.

Length to tip of wings 32 ♂; 26 ♀ millim. Alar expanse 50 millim.

Hab. Arkansas, Rocky Mountains; South Carolina (Zimmerman); Savannah, Georgia; Florida (Norton); New Jersey (Uhler).

Does *M. abdominalis* Say, perhaps belong to the following species?

‡ Spurs present.

4. M. longicauda!

Myrmeleon longicaudus Burm.! Handb. II, 994, 8; Ramb.! Neuropt. 386, 2, tab. xii, fig. 3; Walk.! Catal. 329, 46.

Luteo-fuscous; face luteous, fuscous at the base of the antennæ: vertex obscurely varied with fuscous; antennæ long, thick, clavate, fuscous; palpi equal, luteous; thorax fuscous, obscurely varied with pale; prothorax short; abdomen long, slender, hairy, longer than the wings, the apex forcipated, fuscous; the basal half above obsoletely luteous; feet pale, sprinkled with black; apex of the tibiæ, the whole of the third and fourth articulations of the tarsi and the apex of the last article, black; tibiæ with black spines; spurs as long as the two basal articles of the tarsi; wings narrow, hyaline, veins fuscous; the median and submedian nervure interrupted with white; pterostigma whitish; anterior wings rarely sprinkled with fuscous, with three obsolete, fuscous points at the submedian nervure. I have not seen the female.

Length to tip of wings 40 millim. Alar expanse 48 millim.

Hab. Savannah, Georgia.

5. M. contaminatus.

Myrmeleon contaminatus Burm. Handb. II, 995, 11. Note.

"Most like *M. irroratus*, but entirely black-gray, the hind wings also are densely sprinkled with black." Unknown to me. (From the description of Burm.)

Hab. South Carolina (Zimmerman).

6. M. salvus!

Myrmeleon salvus Hagen!

Luteo-fuscous; face luteous, above black; vertex fuscous, obsoletely variegated; antennæ long, clavate, fuscous, slightly annu-

lated with luteous; palpi luteous, equal; thorax fuscous, varied with pale; prothorax short; abdomen of the male long, slender, the apex forcipated, hairy, longer than the wings, luteous, with two dorsal pale lines; feet yellowish, sprinkled with black, apex of the tarsal articulations, and the fourth entirely black; tibiæ with black spines; spurs as long as the two basal articles of the tarsi; wings narrow, hyaline, veins fuscous, pterostigma white; subcosta, median and submedian nerves white, a little sprinkled with fuscous; posterior margin of the wings a little sprinkled with fuscous, the costal space upon the basal half uniareolated.

Length to tip of wings 32 millim. Alar expanse 46 millim.

Hab. Washington (Osten Sacken); South Carolina (Zimmerman).

M. nebulosus Ramb.! Neuropt. 387, 4; Walk. Catal. 330, 48, is perhaps the female of *M. salvus:* I possess two specimens from Pennsylvania, the one the size of our typical male, the other larger. (Expanding 62 millim.)

7. M. nebulosus.

Myrmeleon nebulosum Oliv. Enc. Method. VIII, 127, 35; Walk. Catal. 409, 212.

Black, marked with yellow; abdomen black, the base of the segments pale; feet yellow; wings hyaline, reticulated with fuscous, with obscure points and spots. (From the description of Olivier.)

Hab. New York.

Unknown to me; does it belong to this section?

8. M. versutus.

Myrmeleon versutus Walk.! Catal. 331, 51.

Black, very slender; front of the head shining, at the eyes and around the base of the antennæ, yellow; vertex with two, interrupted on the middle, yellow bands; face each side with an angular, yellow stripe; palpi yellow, black at the apex; antennæ subfiliform, much longer than the thorax, black; prothorax short, yellow, bivittated with black; a yellow point anteriorly upon the vittæ; meso- and metathorax lineated and pointed with yellow; abdomen very long, slender, the apex forcipated, testaceous, the base striped with piceous, the apex black; feet testaceous; wings hyaline, short, narrow, finely dotted with fuscous; pterostigma

whitish; the apex only of the costal space biareolated. (From the description of Walker.)

Length to tip of wings 30 millim. Alar expanse 46 millim.

Hab. Mexico (Coffin).

9. M. ferox.

Myrmeleon ferox Walk. Catal. 332, 52.

Black, very slender; base of the antennæ encircled with yellow; vertex luteous, with an interrupted black band; face pale yellow; palpi testaceous; antennæ black, almost filiform, longer than the thorax; prothorax narrow, with a dorsal line and two points each side, yellow; beneath yellow; meso- and metathorax margined and pointed with yellow; abdomen much longer than the wings, the apex forcipated, segments each side behind with a testaceous point; feet testaceous, tibiæ and tarsi black at apex; wings cinereous, pterostigma whitish; a brown mark adjoining it on the front wings; veins fuscous, sometimes interrupted with white; anterior wings with three fuscous points at the submedian nerve, and an oblique, apical fuscous streak; posterior wings immaculate; the apex only of the costal space biareolated. (From the description of Walker.) Male.

Length to tip of wings 42 millim. Alar expanse 60 millim.

Hab. California (Hartweg).

10. M. exitialis.

Myrmeleon exitialis Walk. Catal. 376, 133.

Black; mouth luteous, each side with a yellow point; vertex each side with a yellow line and point; antennæ clavate, shorter than the thorax; prothorax short, narrower anteriorly, with six luteous spots, the four anterior ones being placed in a transverse series; meso- and metathorax partly margined with yellow; abdomen shorter than the wings, the segments margined posteriorly with yellow; feet black, femora partly yellow; tibiæ bifasciate with yellow, tarsi yellow at base; wings subcinereous, long, narrow, subacuminate; pterostigma pale yellow, marked each side by a fuscous point, which is obsolete in the posterior wings; veins black, interrupted with yellow; anterior wings with a series of points at the median and submedian nerves, and the veins partly banded with fuscous; only the extreme apex of the costal space biareolated. (From the description of Walker.)

Length to tip of wings 30 millim. Alar expanse 73 millim.

Hab. California (Hartweg).

Female? Does it belong to this section?

11. M. inscriptus!

Myrmeleon inscriptus Hagen!

Black; face yellow, black above; vertex black, with an interrupted line each side, and two points behind, yellow; antennæ black, a little annulated with yellow (apex destroyed); palpi fuscous, articulated with pale; prothorax short, black, a middle line, a lateral one each side and a point anteriorly, yellow; meso- and metathorax black, pointed with yellow; abdomen short, black; feet black, clothed with white hair, base exteriorly of the posterior tibiæ yellow; spurs luteous, of the length of the first tarsal articulation; wings narrow, long, acuminate, subcinereous; anterior ones with the veins fuscous, slightly banded with fuscous, rarely interrupted with white; pterostigma small, white, exteriorly fuscous; at the posterior margin is a fuscous, flexuous, bi-incurved line, reaching the apex; at the median nervure are some hyaline nebulæ, whitish; posterior wings hyaline, veins fuscous, sometimes interrupted with white; the whole of the costal space of the anterior wings biareolated.

Length to tip of wings 34 millim. Alar expanse 60 millim.

Hab. Pecos River, Western Texas (Capt. Pope).

12. M. pumilis!

Myrmeleon pumilis Burm.! Handb. II, 995, 10; Walk. Catal. 401, 173.

Black; face luteous, black above; vertex black, in front with a pale band, clothed with white hairs, transverse; basal article of the antennæ whitish (destroyed in my specimen), "pale, annulated with black, club abrupt, black, Burm.," palpi pale, annulated with fuscous; prothorax narrow, with a triangular, white spot each side anteriorly; meso- and metathorax with some pale points; abdomen black, segments with a pale band upon the middle; feet pale, with white and black spines, femora black above, the apex white, tibiæ white, with a broad basal and apical black ring; articles of the tarsi black at the apex; spurs as long as the two basal articles of the tarsi; wings hyaline, broad; veins white, interrupted with fuscous; anterior wings sprinkled with rare, but sufficiently distinct

fuscous points; pterostigma small, white; only the apex of the costal space biareolated.

Length to tip of wings 20 millim. Alar expanse 35 millim.

Hab. South Carolina (Zimmerman).

* * Costal space with one series of areoles.

‡ No spurs.

13. M. pygmaeus!

Myrmeleon pygmaeus Hagen!

Fuscous, spotted with yellow; face black, with yellow spots; palpi yellow, the last article black; occiput yellow, spotted with black; antennæ short, black, annulated with yellow, the club large, almost orbicular, luteous, varied with fuscous; prothorax short, fuscous, varied with yellow; abdomen short, the dorsum pointed with fuscous, with black hair, and white villosity, venter luteous; feet short, pale, spotted with black; apex of all the tarsal articles black; wings short, the apex very much dilated, the reticulation peculiar, simple, hyaline, pterostigma snow-white, brown interiorly; veins fuscous, the longitudinal ones interrupted with white.

Length to tip of wings 15 millim. Alar expanse 26 millim.

Hab. Mexico (Deppe).

A very singular species; as yet, the smallest of this genus.

‡ ‡ Spurs of the anterior feet as long as the first tarsal joint.

14. M. immaculatus!

Myrmeleon immaculatus De Geer, Mém. III, 365, tab. xxvii, fig. 8; Burm.! Handb. II, 994, 5; Walk. Catal. 401, 174.

Brownish-black; face black, shining, yellowish anteriorly; vertex opaque, with shining black streaks, in front with a transverse, interrupted stripe, the middle with two interrupted, approximated ones, and each side a small one posteriorly; antennæ lurid, clavate, the second article black; palpi lurid; thorax fusco-piceous, obsoletely varied with lurid; abdomen fuscous; feet yellowish, densely sprinkled with black; base and apex of the tibiæ with a black ring; tarsi black, the basal article yellowish, with its apex black; anterior feet obscurer; wings narrow, long, acute, hyaline, a little cinereous; veins with white and black interruptions, pterostigma white, black within.

Length to tip of wings 38—44 millim. Alar expanse 70—80 millim.

Hab. Savannah; Washington (Osten Sacken); Alleghany Mountains, Virginia (Osten Sacken).

Dr. Burmeister's specimen is pale, being a recently excluded one; a specimen from Virginia expands 70 millim., but it is hardly different; the apices of the abdominal segments are pale; but in Burmeister's specimen and another (from Washington), the colors are not distinct.

15. M. tectus.

Myrmeleon tectus Walk. Catal. 378, 135.

Black-gray, robust; head shining, black; mouth luteous, the eyes half encircled with yellow; antennæ black, subclavate, the base annulated with yellow, shorter than the thorax; palpi luteous; prothorax short; meso- and metathorax margined with testaceous; feet black; tibiæ with testaceous bands, those of the posterior ones broader; femora and tarsi testaceous at base; (abdomen mutilated); wings hyaline, narrow subacuminate, pterostigma white, the anterior ones marked with fuscous; veins black, interrupted with yellow. (From the description of Walker.)

Length to tip of wings 42? millim. Alar expanse 74 millim.

Hab. St. John's Bluff, East Florida (Doubleday).

Do the spurs correspond with this section?

16. M. crudelis.

Myrmeleon crudelis Walk. Catal. 388, 152.

Piceous, slender; head anteriorly and beneath testaceous, front black; vertex ferruginous, antennæ ferruginous, clavate, the apex piceous, shorter than the thorax; prothorax long, testaceous, with three piceous vittæ; meso- and metathorax margined with testaceous; abdomen shorter than the wings; feet testaceous; wings hyaline, narrow, subacute; pterostigma obsolete, whitish; veins whitish; subcostal and submedian veins interrupted with fuscous. (From the description of Walker.)

Length to tip of wings 30 millim. Alar expanse 54 millim.

Hab. St. John's Bluff, East Florida (Doubleday).

Do the spurs correspond with this section?

17. M. rusticus!

Myrmeleon rusticus Hagen!

Piceous, robust; front nigro-piceous, shining; mouth and beneath yellowish; eyes narrowly encircled with yellow; palpi luteous, the last article of the labial ones thickened, fusiform, nigro-piceous; antennæ clavate, obscurely annulated with yellow; vertex obscure ferruginous, each side with a yellow point; occiput fuscous, opaque, with two middle, interrupted stripes and a lateral, flat shining spot each side; prothorax short, fuscous, the anterior margin, and three obsolete stripes, yellowish; meso- and metathorax margined with yellow; abdomen luteo-fuscous, the posterior margin of the segments, and sometimes a dorsal middle line, yellowish; feet yellowish, femora and tibiæ with a stripe beneath and an apical ring, fuscous; apex of the tarsi fuscous; wings narrow, hyaline, pterostigma a little whitish; veins yellowish-white, the median and submedian nerves distinctly interrupted with fuscous.

Length to tip of wings 30—33 millim. Alar expanse 50—60 millim.

Hab. Pecos River, Western Texas, August 4 (Capt. Pope); Matamoras; Florida (Norton). Is this *M. crudelis?*

18. M. insertus!

Myrmeleon insertus Hagen!

Piceous, slender; face black, shining, each side and the mouth yellow; palpi yellowish, the last article fuscous; antennæ piceous, a little annulated with yellow, clavate; vertex opaque piceous, with a transverse, interrupted yellow band upon the middle; occiput opaque, with two streaks upon the middle, interrupted, and flat, shining spots upon the sides, fuscous; prothorax luteous, obsoletely trivittate with piceous; meso- and metathorax hoary, narrowly margined with yellow; abdomen piceous, margin of the segments posteriorly luteous; femora fuscous, the base and an apical ring yellow; tibiæ yellow, within and an apical ring brownish-black; tarsi with brownish-black rings; wings long, narrow, acuminate, pterostigma obsoletely white; veins white, the median one distinctly, and the others obsoletely interrupted with fuscous.

Length to tip of wings 33 millim. Alar expanse 58 millim.

Hab. Cuba (Poey); Port au Prince, St. Domingo.

Chanvallon reports that *Myrmeleons* are frequently found in the

island of Martinique; but does not describe any species. Compare Voyage à la Martinique, p. 185.

19. M. leachii.

Formicaleo leachii Guilding, Trans. Linn. Soc. Lond. XVI, 49, 1; Walk. Catal. 373, 127.

Fuscescent, spotted with yellowish; eyes coppery; feet short, pale, tarsi simple, nails moderate; wings hyaline, subfalcate, immaculate, veins ciliated. (From the description of Walker.)

Hab. Jamaica. Unknown to me. Does it belong to this section?

‡ ‡ ‡ Spurs of the anterior feet as long as the two basal articles of the tarsi.

20. M. peregrinus!

Myrmeleon peregrinus Hagen!

Yellow, variegated with blackish-fuscous; head yellow, face with a black spot between the antennæ; palpi yellow, the last article fuscous; antennæ clavate, black, annulated with yellow; vertex yellow, with two transverse black stripes, the posterior one interrupted in the middle, arcuated; prothorax short, yellow, above with four black lines, beneath each side with a black stripe; meso- and metathorax yellow, varied with black; abdomen yellow, the dorsum with three black lines, venter fuscous; feet yellow, densely sprinkled with black, the posterior femora sometimes black in the middle; apex of the tibiæ and tarsi annulated with black; wings long, broad, hyaline, pterostigma yellow, interiorly fuscous; veins yellow, hardly distinctly interrupted with fuscous, at the median and submedian nerves pointed with fuscous; the smaller forks and the transverse veins at the posterior margin of the anterior wings distinctly marked with fuscous.

Length to tip of wings 40 millim. Alar expanse 74 millim.

Hab. California; Pecos River, Western Texas, July (Capt. Pope). Specimens from Matamoras are smaller (expanding 54 millim.), but they are hardly different.

21. M. juvencus!

Myrmeleon juvencus Hagen!

Yellow, varied with black; head and palpi yellow, a spot between the antennæ, and two points upon the vertex, black; anten-

næ yellow, clavate, annulated with black; prothorax short; thorax all yellow; above and beneath bilineated with black; prothorax with the anterior part yellow; abdomen clothed with white hairs, yellowish, dorsum trilineated with black; feet yellow, the whole of the fourth article of the tarsi, and the apex of the last one, black; wings broad, yellowish-hyaline, pterostigma obsoletely whitish; veins yellow, thickly sprinkled with fuscous, especially so at the median and submedian nerves; base and apex of the transverse veins of the costal space, and forks at the posterior margin, fuscous; posterior wings only at the median nerve, sprinkled with fuscous.

Length to tip of wings 30 millim. Alar expanse 54 millim.

Hab. Pecos River, Western Texas, July (Capt. Pope); North America (Collection of Hagen).

22. M. blandus!

Myrmeleon blandus Hagen!

Yellow, varied with black; head yellow; last article of the palpi fuscous; a spot between the antennæ, trifid, black; vertex yellow, black anteriorly, above with two transverse black lines, the hind one interrupted; antennæ black, annulated with yellow; prothorax short, yellow, with two black stripes upon the middle, which are anteriorly, exteriorly incised, beneath each side with a black stripe; meso- and metathorax yellow, lineated with black; abdomen yellow, clothed with white hair, above narrowly trilineated with black; beneath black; feet yellow, all the articles of the tarsi annulated with black at the apex; wings hyaline, broad, pterostigma obsoletely yellow; veins yellow, interrupted with black, especially at the subcosta; transverse ones almost black.

Length to tip of wings 22 millim. Alar expanse 40 millim.

Hab. Pecos River, Western Texas (Capt. Pope).

23. M. bistictus!

Myrmeleon bistictus Hagen!

Testaceous, varied with piceous; face testaceous, last article of the palpi fuscous; a fuscous spot between the antennæ; antennæ clavate, black, annulated with testaceous; vertex opaque, testaceous, with some transverse piceous marks; prothorax short, testaceous, with two stripes in the middle, and a lateral one each side, piceous; meso- and metathorax piceous, varied with testa-

ceous; abdomen (mutilated) piceous, the segments with two longitudinal, testaceous, medial spots; femora piceous, annulated with yellow before the apex; tibiæ yellow, biannulated with fuscous; tarsi black, the anterior ones with the base of the last article yellow; wings long, narrow, acuminate, pterostigma obsoletely white, the anterior ones fuscous within; veins fuscous, interrupted with white; the anterior wings with an oblique apical line, and another at the middle of the posterior margin, fuscous, narrow.

Length to tip of wings 34 millim. Alar expanse 60 millim.

Hab. Cuba (Poey).

‡‡‡‡ Spurs of the anterior feet as long as the three basal articles of the tarsi.

24. M. macer!

Myrmeleon macer Hagen!

Luteous, varied with piceous, slender; face black, mouth and palpi luteous; vertex opaque, luteous, a 4-spotted transverse line, and occipital points, black; antennæ slender, subclavate, longer than the thorax, luteous, annulated with fuscous; prothorax narrow, luteo-fuscous, anteriorly trimaculate with pale; meso- and metathorax obscurely luteo-fuscous; abdomen luteo-fuscous, the segments 2 to 4 yellowish upon the middle; feet long, whitish, slender, knees at the femora, and the base and apex of the tibiæ, annulated with black; tarsi with articles 3 and 4 entirely, and the apex of the last article, black; spurs long, whitish; wings broad, hyaline; pterostigma obsoletely whitish; veins white, with fuscous interruptions, especially at the median nerve; transverse veins almost all fuscous.

Length to tip of wings 34 millim. Alar expanse 60 millim.

Hab. Mexico (Vienna Museum).

25. M. ingeniosus!

Myrmeleon ingeniosus Walk.! Catal. 337, 63.

Fuscous; face yellow, black above; mouth and palpi luteous; apical article of the labial palpi pointed with black in the middle; vertex fuscous, occiput with two transverse, maculose, yellow stripes; antennæ slender, subclavate, longer than the thorax, black, annulated with yellow; prothorax narrow, fuscous, each side with an obsolete line, and the anterior margin, luteous; mesothorax

pointed with luteous; feet short, yellowish, sprinkled with black; third and fourth joints of the tarsi entirely, and the apex of the last joint, black; spurs long, luteous; abdomen fuscous, dorsum of the intermediate segments with a geminate, luteous spot; wings narrow, hyaline, partly milky, pterostigma whitish-yellow; veins pale, densely interrupted with fuscous; anterior wings with two oblique, fuscous streaks, the one at the middle of the posterior margin, the other before the apex.

Length to tip of wings 34 millim. Alar expanse 64 millim.

Hab. South Carolina (Zimmerman); Columbia; Brazil.

The specimens from meridional America are a little different; the occiput is obscurer, less spotted, the prothorax is broader anteriorly: but it is hardly a peculiar species.

EUPTILON Westwood.

This genus is very doubtful; it is only based upon a figure of Drury. It is a *Myrmeleon* with pectinated antennæ.

1. Eu. ornatum.

Hemerobius ornatus Drury, I, 110, 2, tab. xlvi, fig. 2.—*Euptilon ornatum* Drury, ed. Westwood, ib.—*Chauliodes ornatus* Ramb. Neur. 445, 3.—*Myrmeleon ornatus* Walk. Catal. 410, 217.

Green; antennæ pectinated; prothorax anteriorly with a black point; abdomen with yellow rings, and a middle black line; wings hyaline, the anterior ones with two oblique fuscous lines, at the apex and at the middle of the posterior margin.

Length to tip of wings 44 millim. Alar expanse 77 millim.

Hab. Dinwiddie, Virginia (Drury).

I am inclined to believe that antennæ have been affixed to this species artificially, or that the wings have been glued to the body of another kind of insect, by error. The green color is foreign to the genera of *Myrmeleons*.

ASCALAPHUS Fab.

Antennæ very long, slender, capitate; body short; feet short, stout, tibiæ with spurs; wings large, less densely veined than *Myrmeleon*.

* Eyes sulcated.

1. A. hyalinus!

Ascalaphus hyalinus Latr. Humboldt Recueil, II, 118, tab. xl, fig. 7.—*Ascalaphus macleayanus* Guild. Trans. Linn. Soc. Lond. XIV, 140, tab. vii, fig. 11; Walk. Catal. 436, 51.—*Ascalaphus senex* Burm.! Handb. II, 1001, 7.—*Ascalaphus 4-maculatus* Say, Long's Exped. II, 305.

Fusco-ferruginous; front fuscous, above gray, vertex with fuscous villosity; antennæ fuscous, the base with fuscous hair, the apex luteous, incisures black, club oblong, black, beneath striated with luteous; eyes lurid posteriorly; thorax fuscous upon the dorsum, varied with ferruginous; pectus clothed with white hair; feet fusco-luteous, tibiæ with a narrow, black basal annulus, apex of the tarsal articles black; abdomen fusco-cinereous, the dorsum with oblique black streaks each side; wings equal, the apex subobtuse, base of the anterior ones submarginated, the base of the posterior ones with fuscous villosity; hyaline, veins luteous, partly fuscous; pterostigma small, nigro-fuscous.

Alar expanse 55 millim. Length of the antennæ 25 millim.

Hab. Savannah; Pennsylvania (Say); Matamoras, Mexico; Cuba; Island of St. Vincent; Pecos River, Western Texas (Capt. Pope).

2. A. avunculus!

Ascalaphus avunculus Hagen!

Very closely allied to the preceding; it differs in having the vertex clothed with gray villosity; the eyes above, posteriorly yellow, with a transverse brownish-black band, beneath brownish-black; club of the antennæ yellow beneath; in the males, the antennæ much longer; feet fuscous, tibiæ and tarsi black; the head less thick.

Alar expanse 50 millim. Length of the antennæ 23; ♂ 33 millim.

Hab. Cuba (Poey).

3. A. quadripunctatus!

Ascalaphus quadripunctatus Burm.! Handb. II, 1001, 9.—*Ascalaphus trimaculatus* Lefeb.!

Fuscous; front fuscous, gray above, vertex with fuscous villosity; antennæ luteo-fuscous, the incisures black; base with fuscous pile,

club oblong, black; thorax with the dorsum fuscous, beneath with white pile; feet brown-black, the tibiæ exteriorly spotted with luteous; abdomen brownish-cinereous, the base with white villosity, each side with an oblique black streak; wings hyaline, veins black, the costa luteous; pterostigma yellow; the hind wings with three apical, fuscous clouds.

Alar expanse 60 millim. Length of the antennæ 27 millim.

Hab. New York; Baltimore.

4. A. limbatus!

Ascalaphus limbatus Burm.! Handb. II, 1001, 8; Walk. Catal. 436, 53.

Allied to *A. avunculus*, but differs by having shorter antennæ, the club smaller; the apex of the posterior wings, and the posterior margin of the wings clouded with fuscous.

Alar expanse 50 millim. Length of the antennæ 22 millim.

Hab. North America? Jamaica (Gosse).

Ascalaphus surinamensis Walk. Catal. 439, 57, is this species; but the description and synonymy does not belong to it.

5. A. subiratus.

Ascalaphus subiratus Walk. Catal. 439, 58.

Black, with black hair; antennæ fulvous, the incisures black, the club black, testaceous beneath; thorax striped with testaceous; feet piceous; abdomen short; wings hyaline, apex of the anterior ones subfuscescent, base of the posterior ones blackish-fuscous, with four oblique abbreviated fuscous bands posteriorly. (From the description of Walker.)

Alar expanse 58 millim.

Hab. Honduras, Guatemala.

* * Eyes entire.

6. A. albistigma!

Ascalaphus albistigma Walk.! Catal. 452, 80.

Ferruginous, with fuscous hairs; face luteous; antennæ luteous, the club fuscous, yellow beneath; thorax fulvous, anteriorly fuscous; the sides fuscous, spotted with yellow, an obscure cinereous stripe above; feet yellow, tarsi black; abdomen long, fuscous; wings hyaline, the apex fuscescent, pterostigma large, white; an-

terior wings with the whole costal margin, and the apex of the posterior wings fuscous.

Alar expanse 81 millim. Length of the antennæ 18 millim.

Hab. Honduras; Columbia (Appun).

7. **A. microcerus.**

Byas microcerus Ramb. Neuropt. 362.

Hab. West Indies.

May it not be *A. costatus* Burm. Handb. II, 1000, 1.? (Compare South American Neuroptera.)

Fam. IX. PANORPINA.

Body cylindrical or conical; head exserted; antennæ shorter than the wings; mouth rostrated; lateral palpi biarticulated; prothorax small; wings either almost absent or narrow, equal, longer than the body, narrowed at base; the posterior wings with no anal space; tarsi of five articles.

BOREUS Latr.

Ocelli absent; wings of the males imperfect, of the females hardly present.

1. **B. nivoriundus!**

Boreus nivoriundus Fitch! Winter Ins. Amer. Journ. Agricult. 1847, V, 277, 1; Trans. Ent. Soc. ser. 2, I, 96, 1; Walk.! Catal. 456, 2.

Fusco-aeneous; mouth, wings, feet, and genital organs fulvous; apex of the tarsi fuscous.

Length 4 millim.

Hab. New York, April (Asa Fitch).

2. **B. brumalis!**

Boreus brumalis Fitch! Winter Ins. Amer. Journ. Agricult. 1847, V, 278, 2; Trans. Ent. Soc. ser. 2, I, 96, 2; Walk.! Catal. 456, 3.

Entirely brassy-black.

Length 3 millim.

Hab. New York, April (Asa Fitch); Washington (Osten Sacken).

PANORPA Linné.

Three ocelli; wings narrow; genital organs of the male elongated, forcipated, the last segment inflated; two tarsal unguiculi serrated; antennæ setaceous.

1. P. lugubris!

Panorpa lugubris Swederus, Act. Holm. Nov. VIII, 279, 31. Linné, Syst. Nat. ed. XIII. vol. V, 2647, 10. Klug! Act. Berol. 1836, 106, 6. Westw.! Trans. Ent. Soc. Lond. IV, 188, 11. Walk.! Catal. 462, 11.—*Panorpa scorpio* Fab. Entom. Syst. II, 97, 3. Oliv. Enc. Méthod. VIII, 715, 5. Leach. Zool. Misc. II, 99, tab. xciv, fig. 3—4. Burm.! Handb. II, 927, 1. Ramb.! Neuropt. 331, 8.—*Bittacus scorpio* Latr. Gen. Crust. et Ins. III, 189.

Black, abdomen ferruginous; the apex black; wings black, with three transverse, abbreviated, middle white streaks.

Alar expanse 27 millim.

Hab. South Carolina; Georgia; Florida (Glover).

2. P. rufescens!

Panorpa rufiscens Ramb. Neuropt. 330, 6.—*Panorpa germanica* var. Walk. Catal. 459, 2?

Head, rostrum and thorax yellowish-rufous; antennæ black, the extreme base rufous; feet rufo-flavous, apex of the tarsi fuscous, unguiculi tridentate; abdomen fuscous, the venter rufo-flavous; abdominal segment 5 of the male cylindrical, truncated at the apex, above obliquely emarginated, with a long process, which is compressed, somewhat elevated; segments 6 and 7 equal, conical, apex of segment 6 more inflated; segment 8 oval, appendages long, linear; forceps short, trigonal, the apex unguiculated, slender; wings somewhat yellowish, the apex, a pterostigmatical, narrow, maculose band, which is subinterrupted in the middle, and some basal spots, brownish-black.

Alar expanse 24 millim.

Hab. Sharon Springs; Trenton Falls, New York; Washington (Osten Sacken); Maryland (Uhler); La Chine near Montreal? (Barnston).

3. **P. rufa!**

Panorpa rufa Gray! Griffith, Anim. Kingdom, Ins. tab. cv, fig. 2. Westwood! Trans. Ent. Soc. Lond. IV, 188, 10. Walk.! Catal. 461, 10.—*Panorpa fasciata* Klug! Act. Berol. 1836, 105, 2 (partly).

Head rufous, black around the ocelli; rostrum and thorax fusco-rufous; antennæ brownish-black, the extreme base fusco-rufous; feet rufous, apex of the tarsi fuscous; unguiculi 5-toothed, the teeth short; abdomen rufous; segment 5 of the male conical, with the apex truncated; segments 6 and 7 equal, the base narrow, cylindrical, subincurved, the apex conical, segment 6 more inflated; segment 8 narrow, elongate-oval, appendages linear, short; forceps trigonal, short, the apex slender, unguiculated; wings yellow, their apex subacute; apex, a subpterostigmatical band, which is forked behind, a medial costal spot, a basal oblique band, and two basal spots fuscous.

Alar expanse 27 millim.

Hab. Georgia.

4. **P. americana!**

Panorpa americana Swederus, Act. Holm. Nov. VIII, 279, 32. Linné, Syst. Nat. ed. xiii, vol. V, 2647, 9. Westwood, Trans. Ent. Soc. Lond. IV, 189, 15. Walk. Catal. 463, 15.—*Panorpa fasciata* Fab. Ent. Syst. II, 98, 4. Klug! Act. Berol. 1836, 105, 2 (in part). Ramb. Neuropt. 331, 7?

Testaceous; head rufous, black around the ocelli; rostrum rufous; antennæ black, with the extreme base rufous; feet testaceous, apex of the tarsi fuscous, unguiculi 4-toothed (♀); abdomen of the male upon the fifth segment with an erect, short horn (from the description of Westw.); wings yellow, broader at the apex; the apex, a pterostigmatical broad, straight band, a point upon the costa of the anterior wings, a basal oblique band, and a basal point upon the anterior wings, brownish-black.

Alar expanse 25 millim.

Hab. Georgia; Kentucky.

5. **P. venosa!**

Panorpa venosa Westw.! Trans. Ent. Soc. Lond. IV, 190, 16; Walk.! Catal. 463, 16. *Panorpa fasciata* Klug! Act. Berol. 1836, 105, 2 (in part). *Panorpa americana* Say! Collection of Hagen.

Head rufous, black around the ocelli; antennæ black, the extreme base rufous; feet luteo-rufous, the apex of the tarsi fuscous;

unguiculi 4-toothed, teeth long, distant; abdomen fuscous, with the apex rufous; segment 5 of the abdomen of the male cylindrical, the apex truncated, subemarginated above, with a long, very much elevated, triangular process; segments 6 and 7 equal, obconical, apex of the sixth segment more inflated; segment 8 orbicular, with long, linear appendages; forceps short, unguiculate; wings subhyaline, the apex, a pterostigmatical band, which is interruptedly forked behind, a costal, medial spot, which is sometimes almost absent from the hind wings, a basal band, which is sometimes interrupted, and a basal spot, blackish-brown. (Male and female.)

Alar expanse 23—27 millim.

Hab. Philadelphia (Say); Georgia (Abbot); Southern Illinois (Kennicott).

6. P. debilis!

Panorpa debilis Westw.! Trans. Ent. Soc. Lond. IV, 191, 18. Walk.! Catal. 464, 18.

Luteo-fuscous; head rufous, black around the ocelli; antennæ black, the extreme base rufous; feet luteous, apex of the tarsi hardly obscurer; unguiculi 4-toothed, teeth long, distant; abdomen fuscous, the apex luteous; segment 5 of the male cylindrical, the apex truncated, emarginated above, with a short, very erect, obtuse, triangular, rather short process; segment 6 long, obconical, the base narrow, arcuated; segment 7 shorter, obconical, the base a little narrower; segment 8 elliptical, the apex broad, appendages linear, long; forceps short, unguiculated; wings hyaline, subflavescent at base, an apical, fenestrated band, an arcuated, pterostigmatical one, subinterrupted in the middle, a middle point, a basal interrupted band, and a basal point, fuscous; transverse veins sometimes a little marked with fuscous. (Male.)

Alar expanse 22—23 millim.

Hab. Philadelphia; Trenton Falls, New York; Savannah, Georgia.

7. P. nebulosa!

Panorpa nebulosa Westw.! Trans. Ent. Soc. Lond. IV, 188, 12. Walk.! Catal. 462, 12.

Luteo-fulvous; head luteo-rufous, around the ocelli black; antennæ black, the base luteous; feet luteous; unguiculi tridentate;

abdomen fuscous, the apex luteous; segment 5 of the male abdomen conical, truncated at the apex; segments 6 and 7 equal, obconical; segment 8 oval, appendages long, linear; forceps short, unguiculated; wings hyaline, pterostigma subflavous, with a large, fuscous spot interiorly; a fuscous point on some of the areoles, which are sometimes larger on the basal areoles.

Alar expanse 22—26 millim.

Hab. Trenton Falls; Washington (Osten Sacken); Massachusetts (Scudder).

8. P. punctata.

Panorpa punctata Klug! Act. Berol. 1836, 105, 3, fig. 9. Westw. Trans. Ent. Soc. Lond. IV, 188, 12. Walker, Catal. 462, 13.

Testaceous; antennæ black; thorax with spots, and the abdomen at base fuscous; wings subflavescent, narrow, the areoles all pointed with fuscous. (From the description of Klug.)

Alar expanse 23 millim.

Hab. Mexico (Koppe). It is similar to the preceding species.

9. P. confusa.

Panorpa confusa Westw.! Trans. Ent. Soc. Lond. IV, 190, 17. Walk. Catal. 463, 17.

Fulvous; head black around the ocelli; antennæ black; segment 5 of the abdomen of the male armed with a long, acute spine, above; segment 6 not emarginated at the base; wings tinged with luteous, the costa and base deeper luteous; veins blackish; a small basal point, a slender, interrupted, middle band, a slender, irregular, pterostigmatical one, upon the middle geniculated, band, and the apex slenderly, nigricant; the transverse veins, especially towards the apex of the wings, tinged with black; hind wings less variegated; apex of the tarsal articulations black. (From the description of Westw.)

Alar expanse 24 millim.

Hab. Massachusetts (Harris).

10. P. subfurcata.

Panorpa subfurcata Westw.! Trans. Ent. Soc. Lond. IV, 191, 19. Walk. Catal. 464, 19.

Obscure fulvous; head rufescent, black around the ocelli; antennæ black, the two basal articles rufescent; dorsum of the thorax

obscure luteous; feet luteous, apex of the tarsal articles obscure; abdomen luteo-fulvous, the dorsal base obscure; segment 5 with a short dorsal horn; segment 6 not emarginated at the base superiorly; wings pale, with two basal spots, a transverse band before the middle, a transverse, costal medial spot, an oblique pterostigmatical, irregular band, hardly angulated in the middle, but dilated at the costa; the apex, somewhat broadly, upon which are some white points, and a spot at the anal angle, black; basal spots of the posterior wings obsolete. (From the description of Westwood.)

Alar expanse 24—28 millim.

Hab. Nova Scotia; St. Martin's Falls, Albany River, Hudson's Bay (Barnston, Redman).

11. P. maculosa!

Panorpa maculosa Hagen!

Testaceous; head fulvous, rufo-fuscous around the ocelli; antennæ black, the two basal articles fulvous; dorsum of the thorax fulvous, spotted with black; feet luteous, the apex fuscous; unguiculi 4-toothed, teeth long; abdomen testaceous, the apex luteous; segment 5 conical, the apex truncated; segments 6 and 7 equal, conical, the sixth stouter, the base above sub-emarginated; segment 8 elongated, oval, appendages linear, long; forceps short, unguiculated; wings hyaline, veins fuscous, apical transverse veins partly marked with fuscous; two basal spots, a spot upon the middle, and some apical spots, fuscous, pterostigma luteous, each side with a fuscous spot.

Alar expanse 24 millim.

Hab. Pennsylvania (Uhler).

12. P. terminata!

Panorpa terminata Klug! Act. Berol. 1836, 106, 4, fig. 10. Westwood Trans. Ent. Soc. Lond. IV, 189, 14. Walk. Catal. 463, 14.

Fusco-testaceous; middle of the head brownish-black, rostrum rufous; prothorax entirely, and the sides of the mesothorax blackish-brown; antennæ black, the two basal articles rufous; feet luteous, unguiculi tridentate; wings hyaline, the apex fuscous. (Female.)

Alar expanse 23 millim.

Hab. Mexico (Deppe).

BITTACUS Latreille.

Ocelli three; wings narrow; antennæ setaceous, very slender; abdomen rather long, cylindrical, feet longer than the wings, the apex of the tibiæ calcarated; tarsi with a single, long, simple nail.

1. B. mexicanus.

Bittacus mexicanus Klug! Act. Berol. 1836, 99, 6. Walk. Catal. 466, 6.

Testaceous; head with a middle spot, and apices of the femora and tibiæ with a vestige, fuscous; antennæ almost unclothed; wings subflavescent, veins and transverse marks obscurer; appendages of the male long, narrow, incurved. (From the description of Klug.)

Alar expanse 46 millim.

Hab. Mexico (Deppe).

2. B. pilicornis!

Bittacus pilicornis Westw. Trans. Ent. Soc. Lond. IV, 196, 4. Walk. Catal. 468, 15.

Pale fusco-luteous, shining; head fuscous between the ocelli; antennæ luteo-fuscous, with long and dense pile; wings sublutescent, transverse veins obsoletely banded with fuscous; superior appendages of the male broad, triangular, flat.

Alar expanse 40 millim.

Hab. Trenton Falls (Osten Sacken); La Chine near Montreal (Barnston).

3. B. strigosus!

Bittacus strigosus Hagen!

Pale testaceous, shining; head black around the ocelli; palpi black; antennæ pale, sparingly and shortly pilose; apex of the femora and tibiæ blackish-fuscous; wings hyaline, with some basal, fuscous points, transverse veins broadly banded with fuscous; pterostigma a little clouded; superior appendages of the male broad, oblong, the superior margin broadly excised, pilose.

Alar expanse 40 millim.

Hab. Chicago; Washington; St. Louis (Osten Sacken).

4. B. punctiger.

Bittacus punctiger Westw.! Trans. Ent. Soc. Lond. IV, 195, 2. Walk. Catal. 468, 13.

Testaceo-fulvous; femora sparingly clothed with black, bristly hair, tibiæ with a slender, apical black ring; wings yellowish-hyaline, with numerous, rather obscure points, especially at the base of the longitudinal veins, and at the transverse veins; veins pale. (From the description of Westwood.)

Alar expanse 42 millim.

Hab. Georgia.

5. B. stigmaterus!

Bittacus stigmaterus Say, Godman's West. Quart. Report, II, 164.—*Bittacus pallidipennis* Westw.! Trans. Ent. Soc. Lond. IV, 195, 3. Walk. Catal. 468, 14.

Fulvo-luteous; ocelli somewhat surrounded with fuscous; palpi black; anterior femora and apex of the tibiæ sub-fuscous; wings luteo-fusco-hyaline, the pterostigma a little obscurer; veins luteous; superior appendages of the male oblong, long, the apical margin subemarginated above.

Alar expanse 37—46 millim.

Hab. Missouri, near Fort Osage (Say); Maryland (Uhler); Dalton, Georgia (Osten Sacken).

The female from Maryland is smaller, and agrees better with the descriptions and size of *B. stigmaterus*, and *pallidipennis*. The male from Georgia is larger (46 millim.), the wings are also broader, but it is hardly different.

6. B. occidentis.

Bittacus occidentis Walk.! Catal. 469, 16.

Testaceous; apex of the rostrum, the palpi, and the antennæ black; dorsal middle of the thorax fuscous; posterior femora fulvous, with the apex black, the anterior femora black, with the base fulvous; anterior tibiæ piceous; wings sublurid, pterostigma fuscous; veins black. (From the description of Walker.)

Alar expanse 46 millim.

Hab. Erie, Pennsylvania.

It is very much like the preceding species. Is it distinct from it?

7. B. apicalis!

Bittacus apicalis Uhler! MSS.

Luteous, shining; ocelli somewhat obscured with black; apex of the tarsal articles brownish-black; wings hyaline, the apex nigro-fuscous; abdomen fuscous; the superior appendages of the male short, oblong, the apex broader, obliquely truncated.

Alar expanse 36 millim.

Hab. Southern Illinois (Kennicott).

(The pterostigma of the female is dusky, and there is a dusky mark each side upon the upper part of the face; the antennæ are honey-yellow, obscurer towards the apex, and covered with blackish pile. Uhler.)

MEROPE Newman.

Ocelli absent; eyes large, reniform, connate at the vertex; antennæ short, thick, the apex narrowed; wings broad, transverse veins very numerous; subcosta and radius joined together at the apex; feet shorter than the wings, slender, apex of the tarsi with two unguiculi, which are entire, and a plantula between them; abdomen of the male with a very large forceps.

1. M. tuber!

Merope tuber Newm.! Entom. Mag. V, 180. Westw.! Trans. Ent. Soc. Lond. IV, 194, tab. xiv. fig. 2. Walk.! Catal. 196, 1.

Luteous; apex of the rostrum fuscous; antennæ luteous, fuscous in the middle; prothorax luteo-fuscous; feet luteous, the anterior ones a little thicker, luteo-fuscous; apex of the tibiæ with two spurs; wings cinereous, veins luteous, radius and longitudinal ones posteriorly, black; anterior wings on the posterior margin at the base, with a small, rounded, fuscous lamina; abdomen luteous; appendages of the male very long, flat, almost as long as the body, luteous; the basal article almost straight, the base a little curved; the apical article shorter, cylindrical, the apex dilated, emarginated, subbifid.

Alar expanse 30 millim.

Hab. Berkeley Springs, Virginia (Osten Sacken); Pennsylvania.

An extremely rare insect; it is not to be met with in any of the European collections, excepting the type (a female) in the British

Museum, and a male and female in my own collection; it is not extant in the American collections (teste Osten Sacken), excepting a unique female in that of Dr. Asa Fitch. The genus and species is very singular and abnormal; perhaps the most remarkable of all hitherto known Neuroptera. It certainly belongs to the *Panorpina*.

Fam. X. PHRYGANINA.

Body compressed; head exserted; antennæ long, setiform; mouth connate, imperfect; labial palpi triarticulate; prothorax small; wings longer than the body, transverse veins rather few; posterior wings with the anal space large, plicated (rarely absent); tarsi with 5 articulations. *Larva* aquatic; living in a tube-like case.

I. Maxillary palpi differing in the sexes.

Sub-Family PHRYGANIDES.

Spurs arranged 2, 4, 4; maxillary palpi in the males 4-jointed, in the females 5-jointed; three ocelli.

NEURONIA Leach.

Antennæ shorter than the wings; wings rather broad, the apex ovate, naked or almost naked.

1. N. irrorata!

Phryganea irrorata Fab.! Sp. Ins. I, 389, 9; Mantis. Ins. I, 245, 10; Entom. Syst. II, 77, 11.—*Neuronia concatenata* Walk.! Catal. 8, 4.

Rufous, shining; antennæ blackish-piceous, the basal article rufous within; head and thorax clothed with white hair; feet luteous, with black spines; abdomen testaceous; anterior wings whitish-hyaline, densely, transversely irrorated with fuscous; posterior wings hyaline, the apex spotted with fuscous, the anterior margin with a medial, larger, fuscous spot. (Female.)

Length to tip of wings 18 millim. Alar expanse 32 millim.

Hab. St. John's Bluff, East Florida; N. Red River (Kennicott).

The insect does not altogether agree with the description of Fabricius; the type in the collection of Banks is to be examined again.

2. N. pardalis.

Neuronia pardalis Walk.! Catal. 7, 3.

Black, clothed with luteous hair, beneath luteous; anterior femora ferruginous; anterior wings confertly pointed with luteous (which are confluent in the males); posterior wings anteriorly pointed with luteous, and with a broad luteous, subapical band. (From the description of Walker.)

Length to tip of wings 27 millim. Alar expanse 50 millim.

Hab. Nova Scotia (Redman).

3. N. ocelligera.

Neuronia ocelligera Walk.! Catal. 8, 6.

Black, with pale hair; tibiæ piceous; wings testaceous, the anterior ones reticulated and guttated with black, posterior wings having the margin spotted with black. Male. (From the description of Walker.)

Length to tip of wings 16 millim. Alar expanse 28 millim.

Hab. Nova Scotia (Redman).

It is very much like *N. reticulata* of Europe; is it different?

4. N. signata.

Phryganea signata Fab. Sp. Ins. I, 389, 7; Mant. Ins. I, 245, 8; Entom. Syst. II, 76, 8.

Small; head fuscous; wings grayish-fuscous, shining, spotted with yellow, the posterior margin striated with yellow. (From the description of Fabricius.)

Length to tip of wings ——?

Hab. North America (collection of Banks); does it belong to this genus?

5. N. semifasciata!

Phryganea semifasciata Say, Western Quart. Report. II, 161, 4; American Entomology, II, pl. 44 (upper figures). — *Neuronia fusca* Walk.! Catal. 9, 7.

Fulvous; antennæ annulated with fuscous, the apex fulvous; head fuscous; dorsum of the mesothorax each side, black; head and thorax partly ciliated with black; feet with brown spines; wings fulvous, the veins obscurer, the anterior ones transversely flecked with brownish-black, a small basal spot, and an abrupt, medial streak at the posterior margin, brownish-black, the disk

with two yellowish points; posterior wings with the apical margin hardly irrorated with fuscous, having a short, fuscous subapical band.

Male. Having the dorsal lamina elongated, the sides involuted, the apex with two long spines; superior appendages longer than the lamina; ventral lamina 4-toothed.

Female. Ventral lamina shining, the base brownish-black, very much narrower at the apex, recurved, bifid.

Length to tip of wings 23—28 millim. Alar expanse 44—52 millim.

Hab. St. Martin's Falls, Albany River, Hudson's Bay (Barnston); Nova Scotia (Redman); St. John, Newfoundland; Ohio; Pennsylvania; New Jersey; Massachusetts; Kentucky (Say); Washington (Osten Sacken); New York (Collection of Hagen). Everywhere north of the Southern States (Uhler).

A variety has the band absent from the posterior wings (Nova Scotia).

6. **N. postica!**

Neuronia postica Walk.! Catal. 9, 9.

Fulvous; antennæ annulated with fuscous, the apex fulvous; head and thorax fuscous, with fuscous hair; feet with fulvous spines; wings fulvous, veins of the same color; the anterior ones transversely irrorated with fuscous, a small basal spot and an abrupt streak upon the middle of the posterior margin, fuscous; disk with two whitish points; hind wings with an angulated, subapical, fuscous band.

Male. Having the dorsal lamina elongated, the apex narrower, incised; superior appendages with a longer lamina; the ventral lamina bidentate.

Female. Ventral lamina shining, middle of the base brownish-black, each side ciliated with fulvous, the apex narrow, recurved, entire; each side with a rather long anal palpus.

Length to tip of wings 28 millim. Alar expanse 52 millim.

Hab. Georgia (Abbot); Pennsylvania (Collection of Hagen); Washington; Massachusetts (Osten Sacken); N. Red River (Kennicott).

A variety has the band absent from the posterior wings.

Do not some of the localities cited for *N. semifasciata* Say, belong to *N. postica*?

7. N. ocellifera!

Neuronia ocellifera Walk.! Catal. 8, 5.

Fulvous; antennæ shorter, fuscous; thorax ciliated with fuscous-gray; wings short, fulvous, veins same color; anterior wings a little transversely irrorated with fuscous, a medial spot upon the posterior margin fuscous; disk with two whitish points; posterior wings with an angulated band, which is subapical, fuscous; feet with gray spines.

Male. Dorsal lamina long, acute, ensiform, bifid; superior appendages shorter than the lamina; ventral lamina bidentate.

Female. Ventral lamina shining, middle of the base fuscous; the apex narrower, recurved, bi-impressed, ciliated.

Length to tip of wings 20 millim. Alar expanse 40—42 millim.

Hab. Northern Illinois; N. Red River (Kennicott); Ohio (Schaum).

8. N. notata.

Phryganea notata Fab. Sp. Ins. I, 390, 12; Mant. Ins. I, 246, 15; Entom. Syst. II, 78, 18.

Fuscous; antennæ and feet testaceous; anterior wings yellowish-gray, unicolored, with a marginal fuscous spot; posterior wings white, hyaline, shining. (From the description of Fabricius.)

Length to tip of wings — ? millim.

Hab. North America (Collection of Banks).

Is this *N. semifasciata?* The type, if I am not mistaken, yet exists.

PHRYGANEA Linné.

Antennæ robust, as long as the wings; anterior wings pilose.

1. Ph. cinerea.

Phryganea cinerea Walk.! Catal. 4, 2.

Testaceous, striped above with cinereous; apex of the anterior tibiæ, and the tips of the articles of the anterior tarsi, black; anterior wings fuscous, densely guttated with cinereous, posterior wings fusco-cinereous. (From the description of Walker.)

Length to tip of wings 26—28 millim. Alar expanse 48—54 millim.

Hab. St. Martin's Falls, Albany River, Hudson's Bay (Barns-

ton). It is very much like *P. striata* Linn. (*Beckwithii* Steph.), but differs obviously by the anal appendages of the male; a description of those parts is wanting to me.

2. Ph. vestita!

Neuronia vestita Walk.! Catal. 10, 10.

Ferruginous; antennæ fuscous, thorax bivittated above with fuscous, and clothed with fuscous hair; feet luteous, anterior femora, apex of the tibiæ and apex of the tarsal articles, fuscous; apex of the intermediate tibiæ fuscous; anterior wings narrow, rufo-fuscous closely irrorated with fuscous, the disk paler; posterior wings cinereous, the apex margined with fuscous. Female.

Length to tip of wings 21 millim. Alar expanse 38 millim.

Hab. Georgia (Abbot).

3. Ph. commixta.

Neuronia commixta Walk.! Catal. 10, 11.

Black, clothed with pale hair; beneath, antennæ and feet ferruginous; anterior wings fuscous, with a large discoidal sub-hyaline spot, and apical whitish points, veins fuscous, posterior wings subcinereous, the apex and posterior margin fuscous. (From the description of Walker.)

Length to tip of wings 14 millim. Alar expanse 26 millim.

Hab. Georgia (Abbot).

Allied to *Ph. minor*, Curtis, of Europe.

Sub-Fam. LIMNOPHILIDES.

Maxillary palpi of the males three, of the females five-jointed; ocelli three; anterior wings rather narrow, the apex obliquely truncated or rounded.

LIMNOPHILUS Leach.

Spurs arranged 1, 3, 4; apex of the anterior wings truncated.

Sub-Genus **Colpotaulius** Kolenati.

Posterior wings with the middle of the hind margin emarginated.

1. L. perpusillus!

Limnephilus perpusillus Walk.! Catal. 35, 54.

Testaceous, with testaceous hair; antennæ fulvous; anterior wings narrow, the apex a little acuminate, subtestaceous, posteriorly and the apex obscurely guttated; veins fulvous; posterior wings whitish. (From the description of Walker.)

Length to tip of wings 7 millim. Alar expanse 13 millim.

Hab. St. Martin's Falls, Albany River, Hudson's Bay (Barnston).

It is very closely allied to *Colpotaulius incisus* Stephens.

Sub-Genus **Limnophilus** Leach.

Anterior wings narrow, the apex broader, obliquely truncated.

2. L. rhombicus!

L. rhombica Linn. Walk.! Catal. 22, 13. (With the synonymy.)—*Phryganea rhombica* Otho Fab. Fauna Groen. 196, 153. Berlin. Ent. Zeit. III, 143.

Ochreous, with luteous hair, antennæ luteous; thorax luteo-fuscous; feet luteous, tibiæ with yellow, tarsi with black spines; anterior wings ochreous, rufous posteriorly, with a large, discoidal, oblique, rhombical spot, and another, not well defined, about the anastomosis, subhyaline; posterior wings hyaline, the apex subflavescent.

Male. Posterior wings underneath with a subapical fuscous fringe; superior appendages oblong, the apex and beneath a little emarginated, with black teeth.

Length to tip of wings 23 millim. Alar expanse 44 millim.

Hab. St. Martin's Falls, Albany River, Hudson's Bay (Barnston); Greenland (Fab.); Europe; Asia.

The larva described by Otho Fab. l. c. p. 197, belongs to *Colymbetes dolabratus*.

3. L. interrogationis.

Phryganea interrogationis Zetterst. Ins. Lapp. 1063, 12.—*Grammotaulius interrogationis* Kol. Trichopt. 40, 3. Walk. Catal. 19, 6; Berlin. Ent. Zeit. III, 143.

Grayish, shining; antennæ testaceous; head and thorax hairy, each side black; feet testaceous, posterior femora with a lateral line, which is grayish; wings rather narrow, anterior ones brown-

ish, with numerous, confluent fuscous points; a discoidal longitudinal line and a middle spot, hyaline; posterior wings subhyaline, the apex with a small, fuscous line. (From the description of Zetterstedt.)

Length to tip of wings 20 millim. Alar expanse 34—40 millim.

Hab. Greenland; Lapland; Europe.

It is not sufficiently known to me.

4. L. combinatus.

Limnephilus combinatus Walk.! Catal. 28, 34.

Ferruginous, clothed with pale hair; abdomen and feet testaceous; anterior wings fuscous, the anterior margin testaceous, a large rhombical, discoidal spot and some points, testaceous; the apex testaceous, sprinkled with fuscous; posterior wings hyaline. Male. (From the description of Walker.)

Length to tip of wings 18 millim. Alar expanse 34 millim.

Hab. St. John, Newfoundland.

It is allied to *L. rhombicus*.

5. L. divergens.

Limnephilus divergens Walk.! Catal. 30, 39.

Testaceous, clothed with pale hair; antennæ ferruginous; the anterior wings closely dotted with ferruginous tubercles, the apex sub-fuscous; a broader tubercle at the base of the third apical areole; posterior wings whitish. (From the description of Walker.)

Length to tip of wings 18 millim. Alar expanse 34 millim.

Hab. North America.

6. L. dossuarius.

Phryganea dossuaria Say, American Entom. III, pl. 44. Lowest figure.

Pale ochreous; antennæ fuscous; abdomen obscure, apex of the segments pale; anterior wings whitish-yellow, veins black; some transverse, sometimes dilated lines, a pterostigmatical, quadrangular spot, and an anal one, black; posterior wings with two costal spots, and the margin obscure. (From the description of Say.)

Length to tip of wings 11 millim. Alar expanse 22 millim.

Hab. Salem, Massachusetts (Say).

Not seen by me; is it a *Limnophilus?*

7. L. interruptus.

Phryganea interrupta Say, American Entom. III, pl. 44, right middle figure.

Clothed with grayish hair; palpi and antennæ black; tibiæ obscure, tarsi obscure, the joints pale at their bases; anterior wings gray, obscurer upon the disk, a longitudinal, medially interrupted line, extending from the humerus to near the apex, and an abbreviated line nearer the costal margin, towards the apex, black; the posterior area hoary with white pubescence, immaculate; posterior wings ochreous, the apex broadly black. (From the description of Say.)

Length to tip of wings 21 millim. Alar expanse 40 millim.

Hab. New Jersey (Say).

I have not seen it; does it belong to *Limnophilus?*

8. L. radiatus.

Phryganea radiata Say, Long's Exped. II, 308, 2.

Pale yellowish-fuscous; antennæ fuscous; vertex and prothorax pilose; mesothorax each side and two dorsal stripes hairy; anterior wings subhyaline, beyond the middle a large fuscous circle from which a dilated line proceeds to the tip, another to the inferior angle, a third to the carpal spot, and a fourth towards the base, interrupted in its middle, the interior margin, particularly at the base, fuscous; surface of the wings with scattered hairs, those of the nervures more distinct and blackish. (From the description of Say.)

Length to tip of wings 19 millim. Alar expanse 36 millim.

I have not seen it; does it belong to *Limnophilus?*

9. L. sericeus.

Phryganea sericea Say, Long's Exped. II, p. 309, 3.

Blackish, sericeous; antennæ fuscous, annulated with yellow; head with a cinereous gloss, sparingly pilose; thorax with a cinereous gloss; posterior feet pale ochreous, sericeous, with black setæ; anterior wings varied with fuscous and pruinose, a transverse, quadrate, black spot on the middle of the posterior margin; membrane densely pilose; veins with black hairs; posterior wings immaculate. (From the description of Say.)

Length to tip of wings 12 millim. Alar expanse 23 millim.

Hab. Northwest Territory (Say).

I have not seen it; does it belong to *Limnophilus?*

10. L. externus!

Limnophilus externus Hagen!

Luteous; head and thorax obscure above, with luteous hair; antennæ (base) luteous; feet ochreous, with black spines; apex of the abdomen obscurer; anterior wings shining, narrow, hardly luteo-pilose, luteous, densely guttated with fuscous, the marks often confluent; a rhombical spot upon the middle, which is oblique, narrow, hyaline; the anterior margin immaculate; at the anastomosis are a few spots; veins luteous, the fourth apical areole narrow at base, shorter than the rest; posterior wings luteo-hyaline.

Female. The four anal appendages almost equal, short, acute; the valvule short, incised.

Length to tip of wings 20 millim. Alar expanse 38 millim.

Hab. N. Red River (Kennicott).

11. L. gravidus!

Limnophilus gravidus Hagen!

Rufo-fuscous; antennæ (at base) with luteous hair; head and disk of the thorax rufous, with luteous hair, each side with black hair; abdomen luteous beneath; feet luteous, with black spines, base of the four anterior tibiæ, as well as their middle and apex, and the apex of the posterior tibiæ, black, apex of the tarsal articles black; wings long, broad at the apex, a little rounded, sparingly clothed with white hair; surface grayish-hyaline, closely pointed with fuscous, points often confluent; an oblique, discoidal streak, and a semicircle at the apex of the anastomosis, pale hyaline; veins pale, sparingly interrupted with fuscous; posterior wings luteo-hyaline, their apex obsoletely spotted with fuscous, and an obscurer spot at the pterostigma. Female.

Hab. North California.

12. L. vastus!

Limnophilus vastus Hagen!

Nigro-fuscous; base of antennæ fuscous; head and thorax with black hair; mesothorax black, a grayish spot upon the middle, and each side behind marked with a black point; feet luteous, with black spines; four anterior tibiæ at base, middle and apex, apex of the posterior tibiæ, and apices of the tarsal articles, black; wings long, broader at the apex, elliptical, grayish-hyaline, almost

nude, all over closely covered with fuscous dots, the anterior margin with fewer dots; veins fuscous, sparingly interrupted with pale; posterior wings grayish-hyaline, obscurer at the apex. Female.

Length to tip of wings 21 millim. Alar expanse 40 millim.

Hab. Isle Kenai, Russian America.

13. L. perjurus!

Limnophilus perjurus Hagen!

Luteo-fuscous, with luteous hair; feet luteous, with black spines; wings narrow, the apex obliquely truncated, luteo-ochreous, almost shining, with luteous veins; apical veins a little clouded; posterior wings luteo-hyaline. Female.

Length to tip of wings 16 millim. Alar expanse 30 millim.

Hab. Isle Kenai, Russian America.

Allied to *Chaetotaulius striatus* Kolenati.

14. L. hyalinus!

Limnophilus hyalinus Hagen!

Pale ochreous, with yellow hair; antennæ ochreous; feet pale, with black spines; anterior wings pale ochreo-hyaline, somewhat glossy, veins ochreous; the fourth apical cellule acute at base; posterior wings pale yellowish-hyaline.

Male. Superior appendages ovate, prominent; the inferior ones obtuso-acute.

Length to tip of wings 12 millim. Alar expanse 22 millim.

Hab. N. Red River (Kennicott).

Sub-Genus **Goniotaulius** Kol.

15. L. indicans.

Limnophilus indicans Walk.! Catal. 23, 18.

Ferruginous; antennæ paler; palpi and feet testaceous; anterior wings testaceous, margined with whitish, with a short discoidal vitta, contracted in the middle, white, drawn out into five rays towards the apex; posterior wings whitish. (From the description of Walker.)

Length to tip of wings 18 millim. Alar expanse 38 millim.

Hab. Georgia (Abbot).

It is allied to *L. elegans* Curtis.

16. L. despectus.

Limnephilus despectus Walk.! Catal. 31, 42.

Grayish-ferruginous, with pale pile, and longer hair, which is black; antennæ subfuscous, the bases of the articles testaceous; maxillary palpi fuscous, labial palpi testaceous; abdomen and feet testaceous; mesothorax above with a double whitish streak; anterior wings fuscous, freckled with whitish; thyridium and first subapical areole with a whitish spot; costa and disk towards the apex still more whitish; posterior wings whitish. (From the description of Walker.)

Length to tip of wings 11 millim. Alar expanse 21 millim.

Hab. Nova Scotia (Redman).

Allied to *L. griseus* Linn.

17. L. nebulosus.

Limnephilus nebulosus Kirby. Faun. Bor. Amer. 253, 349; Walk. Catal. 50, 126.

Black, with white hair; antennæ (at base) black; mesothorax testaceous; superior wings testaceous, spotted and irrorated with whitish, the costal area immaculate; posterior wings whitish, with testaceous veins; feet testaceous. (From the description of Kirby.)

Length of body 15 millim.

Hab. North America, latitude 65°.

18. L. multifarius.

Limnephilus multifarius Walk.! Catal. 32, 43.—*Phryganea variegata* Barnston, Mss.—*Limnephilus perforatus* Walk. Catal. 33, 46. (In part.)

Black, with pale hair, and longer pile, which is black; antennæ fuscous, annulated with testaceous; feet testaceous; anterior wings fuscous, freckled with whitish; thyridium and base of the apical areoles spotted with white; posterior wings cinereous. (From the description of Walker.)

Length to tip of wings 11 millim. Alar expanse 21 millim.

Hab. St. Martin's Falls, Albany River, Hudson's Bay (Barnston); *L. perforatus* Walk. (from St. Martin's Falls), certainly is the same species; a very much mutilated specimen from Arctic America (Mackenzie and Slave Rivers, Richardson) is different, but indeterminable; possibly the true *L. nebulosus* of Kirby. *L. despectus* and *L. multifarius* are very closely allied; are they distinct?

19. L. femoralis.

Limnephilus femoralis Kirby, Faun. Bor. Amer. 253, 350; Walk. Catal. 50, 127.

Black; feet testaceous, femora black; anterior wings dilute testaceous, spotted and freckled with white; posterior wings white, with the veins testaceous. (From the description of Kirby.)

Length of body 14 millim.

Hab. North America, latitude 65° (Richardson).

I have never seen it; very closely allied to *L. nebulosus* Kirby.

20. L. submonilifer.

Limnephilus submonilifer Walk.! Catal. 33, 48.

Black, with pale hair, and longer, black pile; bases of the antennal articles testaceous; abdomen ferruginous beneath; feet testaceous; anterior wings fuscous, a discoidal, whitish spot, and spots, which are almost obsolete, hyaline; a line anteriorly, and two posteriorly, black and dotted with whitish; posterior wings subcinereous. Female. (From the description of Walker.)

Length to tip of wings 13 millim. Alar expanse 25 millim.

Hab. North America.

It is very closely allied to *L. obscurus* Ramb. Is it different?

21. L. extractus.

Limnophilus extractus Walk.! Catal. 34, 49.

Obscure testaceous, with pale hair; apex of the antennæ fuscous; palpi and feet pale testaceous; mesothorax bivittated with fuscous; abdomen fuscous above; wings dirty whitish, anterior ones with the posterior margin testaceous; veins pale testaceous. Young male. (From the description of Walker.)

Length to tip of wings 12 millim. Alar expanse 23 millim.

Hab. St. Martin's Falls, Albany River, Hudson's Bay (Barnston).

May this not be *L. hyalinus?*

22. L. indivisus.

Limnephilus indivisus Walk.! Catal. 34, 51.

Pale testaceous; antennæ a little obscure; anterior wings subtestaceous, sub-tuberculated, veins testaceous, pterostigma subfuscous; posterior wings hyaline. (From the description of Walker.)

Length to tip of wings 15 millim. Alar expanse 28 millim.

Hab. Nova Scotia (Redman).

It is allied to *L. impurus*, Rambur.

23. L. subguttatus.

Limnephilus subguttatus Walk.! Catal. 34, 52.

Testaceous, with pale hair; base of the anterior wings, margin behind, and the apex subguttated with whitish, a fuscous spot at the pterostigma which is broadly surrounded with hyaline; posterior wings subhyaline. (From the description of Walker.)

Length to tip of wings 12 millim. Alar expanse 23 millim.

Hab. St. Martin's Falls, Albany River, Hudson's Bay (Barnston).

It is allied to *L. rufus* Rambur.

24. L. subpunctulatus!

Phryganea subpunctulata Zetterst. Ins. Lapp.. 1065, 20.—*Limnephilus stipatus* Walk.! Catal. 29, 37.

Black, tinged with gray; covered with luteous hair; antennæ fuscous, annulated with luteous; thorax black-gray, above with a double, luteous, hairy stripe; abdomen annulated beneath with luteous; feet yellowish, with black spines; wings whitish-hyaline, somewhat clothed with snow-white hair, partly veined with fuscous, marked with large, confluent, fuscous guttæ, the anterior margin, disk, and thyridium, almost immaculate; posterior wings whitish-hyaline.

Female. Four anal appendages short, acute, yellowish, valvule broader, emarginated.

Length to tip of wings 13 millim. Alar expanse 25 millim.

Hab. St. Martin's Falls, Albany River, Hudson's Bay (Barnston); Arctic America, Mackenzie and Slave Rivers (Richardson); Europe, Umea, Lapland.

25. L. trimaculatus!

Phryganea trimaculata Zetterst.! Ins. Lapp. 1065, 18; Kolen. Trichopt. 53, 7; Walk. Catal. 26, 27.—*Limnophilus partitus* Walk.! Catal. 32, 45.

Black, with black and white hair; antennæ fuscous, annulated with brown, the basal article black; feet testaceous, with black

spines, femora black; anterior wings fuscous, veined with fuscous, a rhombical, medial spot, and some larger spots about the anastomosis, whitish-hyaline, somewhat clothed with snow-white hair; posterior wings cinereo-hyaline.

Var. Wings pale. (Young.)

Length to tip of wings 10 millim. Alar expanse 19 millim.

Hab. St. Martin's Falls, Albany River, Hudson's Bay (Barnston); Europe, Lapland (Zetterstedt); Iceland (Staudinger).

26. L. pudicus!

Limnophilus pudicus Hagen!

Fusco-cinereous, with fuscous hair; antennæ fuscous, subannulated with pale, the basal article blackish-fuscous; abdomen testaceous beneath; feet testaceous, with black spines, anterior ones a little obscure; anterior tibiæ spotted with black, apices of the tarsal articles blackish; wings brownish-hyaline, partly with fuscous veins, the posterior margin and apex obsoletely guttated with fuscous; pterostigma fuscous, with a discoidal subhyaline spot; posterior wings grayish-hyaline.

Length to tip of wings 14 millim. Alar expanse 25 millim.

Hab. New York; Washington (Osten Sacken).

Allied to *L. costalis*, Stephens.

27. L. griseus!

Phryganea grisea Linn.—*Limnephilus griseus* Walk.! Catal. 27, 28. (With the synonyms); Berlin. Ent. Zeit. III, p. 143.

Rufo-cinereous; antennæ fuscous, annulated with pale; thorax paler in the middle; abdomen blackish-gray, each side with a luteous stripe; feet testaceous; anterior wings narrow, cinereous, spotted with fuscous and black, the apex and posterior margin with spots which are often confluent; a rhombical spot upon the middle, and spots about the anastomosis, which are milky-hyaline; veins fuscous; posterior wings grayish-hyaline, the apex obscurer.

Var. Points and spots partly or altogether confluent, or almost absent.

Length to tip of wings 13 millim. Alar expanse 22 millim.

Hab. Greenland (Kolenati); Europe; Asia, common everywhere.

28. L. plaga.

Limnephilus plaga Walk.! Catal. 35, 53.

Testaceous, with pale hair, and longer black pile; anterior wings pale testaceous, a large, subquadrate, fuscous spot behind the middle; the apex subreticulated with fuscous, and with two patches of fuscous. (From the description of Walker.)

Length to tip of wings 13 millim. Alar expanse 21 millim.

Hab. Nova Scotia (Redman).

Allied to *L. trimaculata*;—a most beautiful species.

Goniotaulius sitchensis Kolenati, Wiener Ent. Monatschr. 1859, p. 17, from North America is spoken of, but only by name; it is unknown to me.

Sub-Genus **Desmotaulius** Kolenati.

29. L. bimaculatus.

Limnephilus bimaculatus Walk.! Catal. 30, 40.

Testaceous, with pale hair, and longer, black pile; antennæ ferruginous; thorax bivittated with piceous; anterior wings obsoletely irrorated with pale, especially at the base; posterior wings whitish. (From the description of Walker.)

Length to tip of wings 19 millim. Alar expanse 34 millim.

Hab. St. Martin's Falls, Albany River, Hudson's Bay (Barnston).

It is allied to *L. fumigatus* Germar, but the wings are shorter.

30. L. planifrons!

Desmotaulius planifrons Kol. Trich. 56, 1; Walk. Catal. 36, 56.

Fuscous, with luteous hairs; antennæ brown, annulated with luteous; head with two tubercles posteriorly, prothorax, and a double stripe upon the metathorax, luteous; feet luteous, with black spines; anterior wings broader, luteo-fuscous, with fuscous hair, obsoletely marked with luteous; at the posterior margin the veins elevated fuscous; posterior wings luteo-hyaline.

Length to tip of wings 14 millim. Alar expanse 25 millim.

Hab. Greenland; Labrador (Collection of Hagen).

ANABOLIA Stephens.

Spurs 1, 3, 4; apex of the anterior wings elliptical.

1. A. sordida!

Anabolia sordida Hagen!

Rufo-fuscous, with black hair; antennæ fuscous; head and thorax at disk rufous; feet rufo-fuscous, with black spines, the tibiæ obscurer exteriorly; anterior wings soiled-luteous, densely pointed with fuscous, almost naked, finely rugulose, thyridium pale; elevated veins smooth, fuscous, the apex partly interrupted with luteous; posterior wings fusco-hyaline.

Male. Superior anal appendages long, laminated, the apex a little oblique; the inferior appendages acute, a little shorter, oblique.

Length to tip of wings 18 millim. Alar expanse 35 millim.

Hab. N. Red River; Northern Illinois (Kennicott).

2. A. punctatissima.

Hallesus punctatissimus Walk.! Catal. 17, 16.

Testaceous, broad; antennæ stout; anterior wings broad, finely rugulose, closely freckled with whitish, the anterior margin almost whitish; a spot upon the middle, and the thyridium whitish; posterior wings whitish. (From the description of Walker.)

Length to tip of wings 13 millim. Alar expanse 25 millim.

Hab. Nova Scotia (Redman).

3. A. consocia.

Limnephilus consocius Walk.! Catal. 33, 47.

Ferruginous, with pale hair; base of the antennæ black; thorax with a broad black stripe; abdomen black above; feet testaceous; anterior wings testaceous, closely irrorated with whitish, the spots often confluent; veins fuscous; posterior wings subhyaline. (From the description of Walker.)

Length to tip of wings 14 millim. Alar expanse 26 millim.

Hab. North America.

It is allied to *Stathmophorus striatus* Kolenati.

4. A. modesta!

Anabolia modesta Hagen!

Nigro-piceous, with black hair; antennæ black, narrowly annulated with luteous; feet luteous, with black spines, femora piceous; anterior wings obtuse at the apex, fuscous, almost naked, subrugulose, sparingly irrorated with luteous, veins fuscous; posterior wings fusco-hyaline.

Male. Superior anal appendages laminated, the apex incurved.

Length to tip of wings 14 millim. Alar expanse 26 millim.

Hab. Labrador (Christopher).

HALLESUS Stephens.

Spurs arranged 1, 3, 3.

1. H. scabripennis!

Limnephila scabripennis Ramb.! Neuropt. 488, 30; Walk. Catal. 47, 105. —*Neuronia antica* Walk.! Catal. 9, 8.

Ferruginous, with luteous hair; antennæ ferruginous, obsoletely annulated; abdomen luteous beneath; feet luteous, with black spines; apex of the anterior wings broad, elliptical, lurid, subtuberculated, with numerous fuscous points, some of which are confluent; with a short, discoidal, incurved, fuscous band, veins lurid; posterior wings luteo-hyaline.

Length to tip of wings 20 millim. Alar expanse 36 millim.

Hab. Georgia (Abbot).

2. H. amicus!

Hallesus amicus Hagen!

Luteous, with luteous hair; antennæ luteous; head, thorax, and dorsum of the abdomen fuscous; feet yellowish, with black spines; anterior wings with the apex obtuse, pale luteous, subnude, subtuberculated, with an apical band and another posteriorly, at the elevated veins, fuscous, both longitudinal; veins luteous, the fourth and fifth apical ones, and behind the elevated one, fuscous; posterior wings luteo-hyaline. Male and female.

Male. Superior appendages small, luteous, ovate; the larger hooks fuscous, distant between the superior appendages.

Length to tip of wings 17 millim. Alar expanse 32 millim.

Hab. New Orleans.

May it not be *H. indistinctus* Walker?

3. H. hostis!

Hallesus hostis Hagen!

Luteo-rufous, with luteous hair; antennæ stout, luteous; thorax each side above, rufo-fuscous; feet luteous, with black spines; apex of the wings broader; pale luteo-hyaline, hardly with luteous hairs, subrugulous, base, at the anal angle, and the third apical vein fuscous; a large, oblique, paler spot upon the middle, veins luteous; posterior wings luteo-hyaline. Male and female.

Male. Posterior appendages short, luteous, ovate, adpressed; the intermediate ones longer, straight, conical, fuscous.

Length to tip of wings 20 millim. Alar expanse 36 millim.

Hab. N. Red River; Northern Illinois (Kennicott).

4. H. guttifer!

Halesus guttifer Walk.! Catal. 16, 15.

Testaceous; antennæ ferruginous; anterior wings tuberculous, with an obsolete, subfuscous spot in the apical areolets, another at the thyridium, and a black dot in the third apical areolet; posterior wings whitish; feet and palpi testaceous.

Male. The fuscous spots of the anterior wings are sometimes obsolete.

Length to tip of wings 20 millim. Alar expanse 36—42 millim.

Hab. St. Martin's Falls, Albany River, Hudson's Bay (Barnston); Georgia (Abbot); New Orleans.

It is very much like *Enoicyla subfasciata* Say, but the spurs will easily distinguish it.

5. H. indistinctus.

Limnephilus indistinctus Walk.! Catal. 37, 60.

Testaceous; antennæ pale ferruginous; head and thorax ferruginous; anterior wings pale testaceous; with a broad fuscous vitta at the posterior margin, and a fuscous line between the fourth and fifth subapical areolets; thyridium whitish. (From the description of Walker.)

Length to tip of wings 16 millim. Alar expanse 29 millim.

Hab. St. John, Newfoundland.

Is it *H. amicus*?

6. H. mutatus!

Hallesus mutatus Hagen!

Fuscous, with fuscous hair; antennæ brown, annulated with luteous; feet yellowish, with black spines, base of tibiæ, as well as the middle and apex, marked with fuscous; wings fuscous, finely tuberculated, closely guttated with pale; a semicircular stripe at the anastomosis apically, and a discoidal irregular spot, pale hyaline; veins fuscous; posterior wings brownish-hyaline. Female.

Length to tip of wings 15 millim. Alar expanse 29 millim.

Hab. Labrador.

The specimen is mutilated.

Hallesus maculipennis Kolenati, from North America, Wien. Ent. Zeit. 1859, p. 18, is noticed only by name;—it is unknown to me.

7. H. solidus!

Hallesus solidus Hagen!

Luteo-testaceous; antennæ brownish-black, the basal article and head luteo-fuscous; feet luteous, with black spines; wings luteo-testaceous, the dorsal portion densely covered with black hair, subhyaline, subscabrous, veins sparingly interrupted with fuscous; with a maculose streak behind, and a marginal one, brownish-black; posterior wings luteo-hyaline. Female.

Length to tip of wings 16 millim. Alar expanse 30 millim.

Hab. Mexico (Deppe).

ENOICYLA Rambur.

Spurs arranged 1, 2, 2.

Sub-Genus (new).

1. E. areolata.

Limnephilus areolatus Walk.! Catal. 35, 55.

Black-gray, with black hair; femora obscure ferruginous; anterior wings whitish, with black veins, many of the areoles with fuscous bands, the apical ones with broader bands; margins ciliated. (From the description of Walker.)

Length to tip of wings 7 millim. Alar expanse 13 millim.

Hab. St. Martin's Falls, Albany River, Hudson's Bay (Barnston).

It is a most beautiful species.

2. E. intercisa!

Limnephilus intercisus Walk.! Catal. 30, 41.

Fuscous, with white hair; antennæ fuscous, annulated with luteous; feet luteous, with black spines, spurs short; anterior wings long, narrow, fuscous, subtuberculous, with white hair; with a discoidal, oblique, spot, the thyridium and a point at the margin of each apical areole, whitish-hyaline; veins lurid; posterior wings grayish-hyaline. Male.

Var. Black, antennæ and feet ferruginous; thorax striped with hoary; anterior wings fuscous, irrorate with whitish, with some oblong darker brown and whitish discoidal spots, and with small white spots at the apex; posterior wings somewhat gray. (From the description of Walker.)

Length to tip of wings 18 millim. Alar expanse 34 millim.

Hab. St. Martin's Falls, Albany River, Hudson's Bay (Barnston).

3. E. praeterita!

Limnephilus praeteritus Walk.! Catal. 32, 44.

Black, with pale hair; antennæ stout, black; feet blackish-brown, with fuscous spines, spurs rather short, fuscous; anterior wings short, the apex elliptical; surface subtuberculated, with a few longer, fuscous hairs, gray-hyaline, sparingly sprinkled with fuscous; fuscous guttæ at the anal angle, at the posterior margin and at the pterostigma, which are confluent; veins black; the margins with short ciliæ; posterior wings cinereo-hyaline.

Length to tip of wings 13 millim. Alar expanse 23 millim.

Hab. Arctic America, Mackenzie and Slave Rivers (Richardson).

4. E. difficilis.

Limnephilus difficilis Walk.! Catal. 34, 50.

Testaceous, with pale hair; antennæ fuscous, the two basal articles altogether and the base of the following ones testaceous; anterior wings subtestaceous, closely, but indistinctly irrorated with hyaline, spots often confluent; veins ferruginous; posterior wings hyaline. (From the description of Walker.)

Length to tip of wings 15 millim. Alar expanse 28 millim.

Hab. Nova Scotia (Redman).

Sub-Genus (new).

5. E. subfasciata!

Phryganea subfasciata Say. Long's Exped. II, 308, 1; American Entom. III, pl. 44 left hand figure. Walk. Catal. 11, 14.

Yellow, with luteous hair; antennæ black, annulated with luteous, the basal article rufous beneath; head and thorax orange above; feet yellow, with black spines, spurs fuscous; anterior wings broad, subrugulose, ochreous, the apex margined with fuscous, the disk with a fuscous circle, which is interrupted anteriorly and posteriorly; thyridium whitish; veins ochreous; posterior wings luteo-hyaline. Female.

Length to tip of wings 22 millim. Alar expanse 40 millim.

Hab. Philadelphia, Pennsylvania; Northwest Territory (Say).

Var. Wings immaculate. (Say.)

6. E. designata!

Limnephilus designatus Walk.! Catal. 24, 19.

Fuscous, with luteous hair; antennæ lurid; thorax above, bivittated with lurid; abdomen luteous beneath; feet yellow, with black spines, spurs long, luteous; anterior wings luteous, almost shining, with a longitudinal stripe, which is broader towards the apex, and margined with fuscous; veins luteous; posterior wings luteo-hyaline. Male.

Length to tip of wings 18 millim. Alar expanse 34 millim.

Hab. St. Martin's Falls, Albany River, Hudson's Bay (Barnston); Arctic America, Slave and Mackenzie Rivers, Great Bear Lake (Richardson); Nova Scotia (Redman).

7. E. lepida!

Enoicyla lepida Hagen!

Luteo-rufous, with luteous hair; antennæ fuscous, annulated with luteous, the basal article luteous; head and thorax above, rufous; feet yellowish, with black spines; spurs yellowish; anterior wings broader, rugulose, subnude, luteous, with a fuscous point in the base of the third areole; veins luteous; posterior wings luteo-hyaline. Male.

Length to tip of wings 15 millim. Alar expanse 28 millim.

Hab. Pennsylvania.

APATANIA Kolenati.

Spurs arranged 1, 2, 4.

1. A. nigra.

Potamaria nigra Walk.! Catal. 83, 4.

Black, with black pile; beneath, a little clothed with luteous hair; antennæ rather short; breast grayish; apices of the abdominal segments, base of the tarsi, and tibiæ ferruginous; wings blackish, clothed with black pile. (From the description of Walker.)

Length to tip of wings 9 millim. Alar expanse 16 millim.

Hab. St. Martin's Falls, Albany River, Hudson's Bay (Barnston).

2. A. pallida!

Apatania pallida Hagen!

Black, with luteous pile; antennæ black; feet pale, with black spines, femora fuscous; anterior wings luteo-hyaline, and the veins same color, with luteous pile and cilia; posterior wings hyaline. Male.

Length to tip of wings 8 millim. Alar expanse 15 millim.

Hab. St. Lawrence River, Canada (Osten Sacken).

Sub-Family SERICOSTOMIDES.

Ocelli absent; palpi pilose.

SERICOSTOMA Latreille.

Spurs arranged 2, 2, 4; maxillary palpi of the males 4-jointed, covering the face like a mask.

1. S. americanum.

Sericostoma americanum Walk.! Catal. 85, 8.

Black, clothed with black hair; antennæ twice the length of the body; feet piceous; wings blackish-fuscous, pilose; the anterior wings much longer than the posterior ones. (From the description of Walker.)

Length to tip of wings 19 millim. Alar expanse 34 millim.

Hab. Georgia (Abbot).

2. S. crassicorne.

Hydropsyche crassicornis Walk.! Catal. 113, 35.

Ferruginous, with lurid hair; antennæ stout, longer than the body, articles paler at their bases; palpi and feet testaceous; wings cinereous, with fulvous pile; anterior wings with a hyaline spot at the base of the apical areolets; veins fuscous. (From the description of Walker.)

Length to tip of wings 11 millim. Alar expanse 20 millim.

Hab. Georgia (Abbot).

NOTIDOBIA Stephens.

Spurs arranged 2, 2, 4; maxillary palpi of the males masking the face, recurved.

1. N. borealis!

Notidobia borealis Hagen!

Brownish-black, with luteous hair; antennæ bright yellow, the basal article and the palpi black, hairy; feet pale, whitish; wings fusco-hyaline, the anterior wings densely covered with luteous hair, and ciliated with luteous. Male.

Length to tip of wings 7 millim. Alar expanse 13 millim.

Hab. Washington; St. Lawrence River, Canada (Osten Sacken).

2. N. pyraloides!

Notidobia pyraloides Walk.! Catal. 90, 2.

Fulvous, with fulvous hair; antennæ twice the length of the body, testaceous, with the base fuscous, and the apices of the basal articles testaceous; the first article stout, testaceous; feet testaceous; wings fuscous, with fuscous pile and ciliæ; veins fuscous.

Length to tip of wings 14 millim. Alar expanse 25 millim.

Hab. Georgia (Abbot); North America; Pennsylvania.

3. N. lutea!

Notidobia lutea Hagen!

Yellow, with luteous hair; antennæ subannulated with brown; palpi yellow, interiorly with black hair; feet yellowish; wings yellowish hyaline, sparingly clothed with luteous hairs and ciliated with luteous; posterior wings hyaline. Male and female.

Length to tip of wings $6\frac{1}{2}$ millim. Alar expanse 11 millim.
Hab. St. Domingo.

BRACHYCENTRUS Curtis.

Spurs arranged 2, 3, 3.

1. B. fuliginosus.

Brachycentrus fuliginosus Walk.! Catal. 88, 7.

Black, with hoary hair; antennæ long, ferruginous, apices of the abdominal segments, and the legs testaceous; palpi testaceous, with the apex blackish; the anterior wings grayish-fuscous, veins ferruginous; posterior wings cinereous. (From the description of Walker.)

Length to tip of wings 14 millim. Alar expanse 26 millim.
Hab. St. Martin's Falls, Albany River, Hudson's Bay (Barnston).

2. B. incanus!

Brachycentrus incanus Hagen!

Black; sparingly clothed with hoary hair; antennæ black, feet pale, femora black; anterior wings long, grayish-hyaline, with some luteous spots, and sparse luteous pile; veins gray; posterior wings grayish-hyaline. Female.

Length to tip of wings 13 millim. Alar expanse 24 millim.
Hab. Washington, April (Osten Sacken).
It is similar to *B. subnubilus* Curtis.

SILO Curtis.

Spurs arranged 2, 4, 4.

1. S. californicus!

Silo californicus Hagen!

Fuscous; antennæ stout, brownish-black; head and thorax black, with yellow pile; feet fuscous; anterior wings fuscous, with fuscous pile, veins blackish fuscous; some yellow, hairy streaks between the longitudinal veins; posterior wings fuscous. Female.

Length to tip of wings 17 millim. Alar expanse 32 millim.
Hab. North California.

2. S. griseus!

Silo griseus Hagen!

Brownish-gray, with fuscous hair; antennæ brownish-gray, the apex subannulated with lurid; head, and thorax above, rufescent; feet pale, the posterior ones and the spurs fuscous; anterior wings narrow, brownish-gray, hairy, with long cilia; posterior wings cinereous. Male.

Length to tip of wings 6 millim. Alar expanse 11 millim.

Hab. Trenton Falls (Osten Sacken).

MORMONIA Stephens.

Spurs arranged 2, 4, 4; antennæ with the basal joint long, thick, very hirsute.

1. M. togata!

Mormonia togata Hagen!

Brownish-gray; with luteous hair; antennæ pilose, pale yellow, annulated with fuscous, the basal article long, brownish-gray, hairy; palpi and feet pale; abdomen fuscous; anterior wings narrow, fuscous, with luteous hair, veins fuscous, with fuscous pile; posterior wings cinereous. Female.

Length to tip of wings 9 millim. Alar expanse 16 millim.

Hab. Washington; St. Lawrence River, Canada (Osten Sacken).

DASYSTOMA Rambur.

Spurs arranged 2, 2, 2.

1. D. numerosum.

Phryganea numerosa Say, Western Quart. Rep. 1823, II, p. 160, 2.

Black, with cinereous hair; antennæ as long as the body, pale fuscous, the basal article black, hairy; palpi pale fuscous; head short, black, densely covered with cinereous hair; thorax black, with cinereous hair; feet pale fuscous; abdomen black, the apices of the segments pale rufous, lateral line rufous; wings whitish-brown, immaculate, veins fuscous. (From the description of Say.)

Length to tip of wings 12 millim. Alar expanse 23 millim.

"This species appears in vast numbers early in May, from the "7th to the 9th of that month, on the Ohio River. Having a "white appearance when flying, they might be compared to flakes "of snow in a moderate fall of that meteor." (Say.)

May it not belong to *Brachycentrus?* Can it be *B. fuliginosus?*

2. D. laterale.

Phryganea lateralis Say, Western Quart. Rep. 1823, II, p. 161, 3.

Black, above with cinereous hair, beneath with plumbeous hair; antennæ and mouth pale; feet whitish; abdomen black, with a lateral pale stripe, and the apices of the segments pale; appendages white; wings whitish, the anterior ones spotted with fuscous, a common spot on the middle of the inner margin, and several near the tip somewhat arranged into a band, the costal one of which is larger; posterior wings white, immaculate. (From the description of Say.)

Length to tip of wings 10 millim. Alar expanse 18 millim.

Hab. "Shippingsport, Kentucky, Ohio River; they appeared "in very great numbers at the banks of the Ohio on the 21st of "May; judging from the small space of about half a mile on the "Indiana side of the river, where I had the opportunity to see "them, their number could have been but little inferior to that of "*P. numerosa*, which occurred a few days before, but of which a "specimen was now rarely to be seen." (Say.)

May it not belong to *Brachycentrus?*

HYDROPTILA Dalman.

Spurs of the male arranged 0, 3, 4; female 0, 2, 4.

1. H. tenebrosa.

Hydroptila tenebrosa Walk. Catal. 134, 11.

Blackish; antennæ fuscous, the basal article larger, ovate; feet testaceous; wings blackish-gray, ciliated, with black veins. (From the description of Walker.)

Length to tip of wings 4 millim. Alar expanse 6 millim.

Hab. St. Martin's Falls, Albany River, Hudson's Bay (Barnston).

2. H. albicornis!

Hydroptila albicornis Hagen!

Gray; antennæ stout, snow-white, with the middle and apex fuscous; palpi whitish; head with snow-white hair, the vertex with fuscous hair; thorax fuscous; feet whitish, the posterior ones ciliated with white; anterior wings grayish-fuscous, ciliated with gray, the margin and disk pointed with snow-white; posterior wings gray, clothed and ciliated with gray hair. Female.

Length to tip of wings $3\frac{1}{2}$ millim. Alar expanse 6 millim.

Hab. St. Lawrence River, Canada (Osten Sacken).

3. H. tarsalis!

Hydroptila tarsalis Hagen!

Gray; antennæ somewhat robust, rather long, fuscous, with gray hair; palpi black, the apex snow-white; head black, the vertex white; thorax fuscous; feet whitish, anterior tibiæ, spurs, and tarsi fuscous, the latter annulated with white; posterior feet with gray cilia; anterior wings fuscous, the anterior margin black, ciliated with gray, and pointed with snow white; posterior wings with gray hairs and cilia. Male.

Length to tip of wings 3 millim. Alar expanse $5\frac{1}{2}$ millim.

Hab. St. Lawrence River, Canada (Osten Sacken).

Is this the other sex of the preceding species?

I. Maxillary palpi of both sexes with five articles.

Sub-Fam. LEPTOCERIDES.

Ocelli wanting; antennæ setaceous, long, or extremely long; maxillary palpi elongated, hirsute, with the last article mobile.

MOLANNA Curtis.

Spurs arranged 2, 4, 4.

1. M. inconspicua.

Leptocerus inconspicuus Walk.! Catal. 71, 63.

Ferruginous, with pale hairs: base of the antennæ testaceous; palpi and feet testaceous; abdomen blackish; wings gray, with testaceous hair and pale veins. (From the description of Walker.)

Length to tip of wings 12 millim. Alar expanse 23 millim.

Hab. Georgia (Abbot). It is allied to *M. angustata.*

2. M. cinerea!

Molanna cinerea Hagen!

Ferruginous, sparingly clothed with gray hair; antennæ stout, ferruginous; palpi ferruginous; anterior feet ferruginous, the four posterior ones gray, the tarsi with black spines; wings narrow, gray, clothed with gray hair, the apex obsoletely marmorated with fuscous; posterior wings gray.

Length to tip of wings 12 millim. Alar expanse 23 millim.

Hab. St. Lawrence River, Canada (Osten Sacken). Can this be *M. inconspicua?*

3. M. rufa!

Molanna rufa Hagen!

Rufo-fuscous, with fuscous hair; antennæ and palpi rufous; feet testaceous, the anterior ones and femora rufous; abdomen fuscous; wings fuscous, with rufous hair; posterior wings fuscous; veins fuscous.

Length to tip of wings 10 millim. Alar expanse 18 millim.

Hab. Trenton Falls (Osten Sacken).

LEPTOCERUS Leach.

Spurs arranged 2, 2, 2; antennæ of the males extremely long.

1. L. albostictus!

Leptocerus albostictus Hagen!

Luteous; antennæ black, the basal half narrowly annulated with white, the basal article rufous; palpi fuscous; head with snow-white hair; abdomen fuscous; feet whitish, anterior tibiæ and tarsi spotted with fuscous; anterior wings luteous, all over very finely pointed with white, and with an anal snow-white spot; veins luteous; cilia fuscous; posterior wings gray. Male.

Length to tip of wings 11 millim. Alar expanse 21 millim.

Hab. North America. (Collection of Hagen.)

2. L. lugens!

Leptocerus lugens Hagen!

Fuscous; antennæ black, the basal half annulated with snow-

white; palpi fuscous; head with snow-white hair; feet snow-white, base of the femora fuscous, the four anterior tarsi spotted with fuscous; anterior wings rufo-fuscous, with fuscous hair, and luteous hair intermixed, a whitish-yellow spot at the anal angle; veins fuscous; cilia paler; posterior wings gray. Male and female.

Length to tip of wings 11 millim. Alar expanse 21 millim.

Hab. St. Lawrence River, Canada (Osten Sacken).

3. L. dilutus!

Leptocerus dilutus Hagen!

Grayish-fuscous; antennæ fuscous, the basal half broadly annulated with snow-white; palpi fuscous, with snow-white hair; head with snow-white hair; feet snow-white, bases of the femora a little obscured; abdomen fuscous; anterior wings gray, with luteous hair, sometimes obsoletely varied with fuscous; veins gray; cilia fuscous; with an anal yellowish spot; posterior wings gray. Male and female.

Length to tip of wings 7—10 millim. Alar expanse 13—19 millim.

Hab. Chicago (Osten Sacken).

4. L. niger!

Phryganea nigra Linné.—*Mystacides nigra* Pict.! Phryg. 169, 10, pl. xii, fig. 5.—*Leptocerus niger* Walk.! Catal. 58, 6. (With the synonymy).

Black, shining, with black hair; antennæ black, the basal half annulated with snow-white, the basal article rufous; head black, shining; palpi very densely black-hirsute; abdomen black; feet luteous, intermediate ones snow-white, tarsi spotted with fuscous; anterior wings steel-blue black, posterior wings blackish. Male.

Length to tip of wings $7\frac{1}{2}$ millim. Alar expanse 14 millim.

Hab. Washington (Osten Sacken); it is found everywhere in Europe.

5. L. sepulchralis.

Leptocerus sepulchralis Walk.! Catal. 70, 57.

Black, with black hair; antennæ black, the base annulated with white; apex of the abdomen ferruginous; feet testaceous; wings blackish. (From the description of Walker.)

Length to tip of wings 8 millim. Alar expanse 13 millim.

Hab. St. Martin's Falls, Albany River, Hudson's Bay (Barnston). Very closely allied to *L. ater*, Pictet; is it distinct?

6. L. variegatus!

Leptocerus variegatus Hagen!

Luteo-fuscous, with snow-white hair; antennæ luteo-fuscous, the basal half annulated with snow-white, the basal article luteo-fuscous; palpi fuscous, with gray hair; head fuscous, sparingly clothed with white hair; feet gray, tarsi snow-white, spotted with fuscous; anterior wings grayish-fuscous, with brown and gray hairs, spotted with gray, especially at the apex, margin and anal angle; veins stout, fuscous; posterior wings cinereous. Male.

Length to tip of wings 14 millim. Alar expanse 27 millim.

Hab. Chicago (Osten Sacken).

7. L. submacula.

Leptocerus submacula Walk.! Catal. 70, 59.

Black, with black hair; antennæ extremely long; palpi hairy; tibiæ and tarsi testaceous; wings cinereous, the anterior ones sprinkled with white, and with three whitish spots, the one basal, the second discoidal, subcostal, and the third anal; veins black. (From the description of Walker.)

Length to tip of wings 14 millim. Alar expanse 25 millim.

Hab. St. Lawrence River. It is allied to *L. venosus* Ramb.; is it perhaps, *L. variegatus?*

8. L. mentiens.

Leptocerus mentiens Walk.! Catal. 71, 60.

Ferruginous, hairy; antennæ black, annulated with white; palpi hairy; tarsi banded with white; anterior wings cinereo-fuscous, with ferruginous pubescence, veins ferruginous; posterior wings cinereous. (From the description of Walker.)

Length to tip of wings 10 millim. Alar expanse 19 millim.

Hab. St. Martin's Falls, Albany River, Hudson's Bay (Barnston). Is this *L. lugens* Hagen?

9. L. incertus.

Leptocerus incertus Walk.! Catal. 71, 61.

Obscure testaceous, with golden hair, and more scarce black pile;

beneath whitish; antennæ extremely long, whitish; palpi hairy; apex of the abdomen ferruginous; feet whitish; wings cinereous, the anterior ones with golden pubescence. (From the description of Walker.)

Length to tip of wings 7 millim. Alar expanse 12 millim.

Hab. St. Martin's Falls, Albany River, Hudson's Bay (Barnston).

10. L. elegans.

Goëra elegans Walk.! Catal. 95, 5.

Testaceous, with testaceous pile; antennæ annulated with black; wings cinereous, the anterior ones with testaceous pubescence. (From the description of Walker.)

Length to tip of wings 12 millim. Alar expanse 23 millim.

Hab. North America?

11. L. indecisus.

Goëra indecisa Walk.! Catal. 95, 6.

Black, with black hair; feet ferruginous; antennæ extremely long; palpi very hairy; wings blackish, the anterior ones with fuscous pubescence. (From the description of Walker.)

Length to tip of wings 11 millim. Alar expanse 21 millim.

Hab. St. Martin's Falls, Albany River, Hudson's Bay (Barnston).

12. L. latifascia.

Notidobia latifascia Walk! Catal. 90, 3.

Testaceous, with testaceous hair; antennæ annulated with fuscous; anterior wings with a broad, obliqne, fuscous band upon the middle; posterior wings cinereous. (From the description of Walker.)

Length to tip of wings 10 millim. Alar expanse 19 millim.

Hab. North America.

13. L. transversus!

Leptocerus transversus Hagen!

Grayish-fuscous, with snow-white hair; antennæ fuscous, annulated with white, the basal article fuscous; palpi fuscous, with gray hair; head and thorax fuscous, with white and fuscous hair; feet

luteo-fuscous, with snow-white pile, tarsi spotted with fuscous; anterior wings fuscous, ciliated with fuscous, varied with cinereous, and with an anal cinereous spot; veins stout, fuscous; posterior wings cinereous; abdomen luteous. Male and female.

Length to tip of wings 7—9 millim. Alar expanse 13—17 millim.

Hab. Washington (Osten Sacken).

Leptocerus uwarowii Kol. Wien. Ent. Zeit. 1859, p. 58, is noticed only by name; it is entirely unknown to me.

SETODES Rambur.

Spurs arranged 0, 2, 2.

1. S. exquisita!

Leptocerus exquisitus Walk.! Catal. 72, 65.

Pale yellow, with snow-white hair; antennæ luteous, the base annulated with fuscous, the basal article yellow, with snow-white hair; head and thorax yellow, with snow-white hair; palpi and abdomen yellow; feet snow-white; anterior wings snow-white, with some transverse luteous bands, the apical ones maculose, imperfect; at the apex of the posterior margin are four black spots, and some obsolete black streaks; posterior wings snow-white. Male and female.

Length to tip of wings 8—13 millim. Alar expanse 15—25 millim.

Hab. Georgia (Abbot); Washington; St. Lawrence River, Canada (Osten Sacken). This is an extremely beautiful species.

2. S. candida!

Setodes candida Hagen!

Pale yellow, with snow-white hair; antennæ fuscous, the basal half yellowish, annulated with fuscous, the basal article yellow, with snow-white pile; head and thorax with snow-white hair; palpi, abdomen, and feet pale yellow; anterior wings snow-white, with luteous, sparse spots all over, which are sometimes obsolete; the posterior margin a little marked with black, the anal angle ciliated with black; posterior wings snow-white. Male and female. The female is more and deeper spotted upon the wings than the male.

Length to tip of wings 12—15 millim. Alar expanse 23—28 millim.

Hab. Georgia; Philadelphia, Pennsylvania (Zimmerman); Ohio River; Florida (Osten Sacken); South Carolina (Zimmerman).

3. S. nivea!

Setodes nivea Hagen!

Brownish-black, with snow-white hair; antennæ snow-white, the base subannulated with fuscous, the basal article yellow, with snow-white hair; head yellow, the disk brownish-black, with snow-white hair; thorax brownish-black, with snow-white hair; palpi and feet pale; abdomen luteous; anterior wings snow-white, with fuscous veins, at the apex transversely, obsoletely clouded; posterior wings snow-white. Male.

Length to tip of wings 15 millim. Alar expanse 28 millim.

Hab. St. Lawrence River, Canada (Osten Sacken).

4. S. ochracea!

Leptocerus ochraceus Curtis! Brit. Ent. II, pl. 57; Steph. Illust. VI, 195, 1.—*Phryganea hectica* Zetterst. Ins. Lapp. 1072, 48.—*Mystacides obsoleta* Ramb.! Neuropt. 509, 4.—*Leptocerus ochraceus* Walk.! Catal. 57, 1.

Pale ochreous; articles of the antennæ subfuscous; head, thorax, abdomen, palpi, and feet, pale ochreous,; anterior wings ochreous, with ochreous pile; veins a little deeper; posterior wings pale. Male and female.

Length to tip of wings 14 millim. Alar expanse 27 millim.

Hab. Georgia (Abbot); Europe everywhere.

I observed one specimen in the British Museum which was referred to *Leptocerus* (*Molanna*) *inconspicuus*.

5. S. ignita!

Leptocerus ignitus Walk.! Catal. 72, 64.

Pale testaceous, with testaceous hair; antennæ snow-white, the basal article testaceous; palpi with testaceous hair; head, thorax, abdomen, and feet, pale; anterior wings testaceous-yellow, with yellow hair and cilia, a point upon the middle of the posterior margin, and another anal one, black, with black almost elevated pile; posterior wings pale. Male.

Length to tip of wings 10 millim. Alar expanse 19 millim.

Hab. Georgia (Abbot); Washington (Osten Sacken); Mexico (Deppe).

6. S. pavida!

Setodes pavida Hagen!

Pale yellow, with yellow hair; antennæ pale, annulated obscurely; palpi, head, thorax, abdomen, and feet, pale yellow; anterior wings yellow, with yellow hair and veins, pointed with fuscous, the points small, longitudinally placed in series; posterior wings pale.

Length to tip of wings 7 millim. Alar expanse 13 millim.

Hab. Washington (Osten Sacken).

The specimen is damaged.

7. S. cinerascens!

Setodes cinerascens Hagen!

Pale fuscous, with cinereous hair; antennæ (? pale) at base, with cinereous hair; head, thorax, and palpi, fuscous, with cinereous hair; feet luteous; anterior wings cinereous, with cinereous hair, varied with fuscous; veins with dense and long cinereous and fuscous hair; cilia cinereous; posterior wings cinereous.

Length to tip of wings 10 millim. Alar expanse 19 millim.

Hab. Washington (Osten Sacken).

The specimen is mutilated.

8. S. flaveolata!

Setodes flaveolata Hagen!

Pale yellow, with yellow hair; antennæ whitish-yellow, a little annulated with fuscous, the basal article yellow; palpi, head, thorax, and feet, pale yellow; anterior wings yellow-ochreous, with yellow hair, veins, and cilia; posterior wings cinereous. Male and female.

Length to tip of wings 7 millim. Alar expanse 13 millim.

Hab. Washington (Osten Sacken); New Orleans.

9. S. resurgens.

Leptocerus resurgens Walk.! Catal. 70, 58.

Fuscous, with whitish hair; palpi and feet fulvous, a little covered with whitish hair; anterior wings fuscous, with white spots

at the base, and at the disk and apex of the apical areoles; posterior wings cinereous. (From the description of Walker.)

Length to tip of wings 16 millim. Alar expanse 30 millim.

Hab. St. Martin's Falls, Albany River, Hudson's Bay (Barnston).

10. S. albida.

Leptocerus albidus Walk.! Catal. 71, 62.

Fuscous, with whitish hair; base of the antennæ annulated with white; palpi testaceous; feet whitish; wings whitish, with testaceous veins. (From the description of Walker.)

Length to tip of wings 13 millim. Alar expanse 25 millim.

Hab. St. Martin's Falls, Albany River, Hudson's Bay (Barnston).

Allied to *S. resurgens;*—may it not be immature?

11. S. injusta!

Setodes injusta Hagen!

Luteous, with luteous hair; antennæ luteous, subannulated with fuscous; palpi with luteo-fuscous pile; feet and abdomen pale luteous; anterior wings luteous, with ochreous pile and cilia, the anterior margin at base a little obscurer; the anal angle a little fuscous, and ciliated with fuscous hair; posterior wings luteous, with pale cilia. Male.

Length to tip of wings 12 millim. Alar expanse 23 millim.

Hab. St. Lawrence River, Canada (Osten Sacken); Chicago (id.).

12. S. immobilis!

Setodes immobilis Hagen!

Fuscous, with luteous hair; antennæ fuscous, the basal article luteous; palpi with fuscous hair; head and thorax fuscous; feet luteous; abdomen fusco-luteous; anterior wings fuscous, with luteous hair, the margin obsoletely spotted with fuscous, ciliated with fuscous; posterior wings brown-gray, with gray cilia. Male.

Length to tip of wings 7 millim. Alar expanse 13 millim.

Hab. St. Lawrence River, Canada (Osten Sacken).

13. S. micans!

Setodes micans Hagen!

Luteous, with fuscous hair; antennæ whitish-yellow, the basal

article luteous; palpi with fuscous hair; head and abdomen luteous; feet whitish-yellow; anterior wings luteo-fuscous, subnude, the disk shining purple, anastomosis fuscous, cilia long, fuscous; posterior wings obscure, entirely shining purplish, with fuscous cilia.

Length to tip of wings 8 millim. Alar expanse 15 millim.

Hab. Washington (Osten Sacken); Mexico (Deppe).

Is this *L. incertus* Walker?

14. S. sagitta!

Setodes sagitta Hagen!

Luteous, with luteous hair; antennæ whitish, a little annulated with fuscous; palpi with fuscous hair; head and thorax luteous; feet whitish-yellow; anterior wings luteous, subnude, ciliated with luteous, anastomosis and apical margin spotted with fuscous; posterior wings gray, the apex long, acute, narrow, ciliated with gray. Male.

Length to tip of wings 11 millim. Alar expanse 21 millim.

Hab. Florida (Osten Sacken).

Sub-Fam. HYDROPSYCHIDES.

Ocelli none or three; the last article of the maxillary palpi very long, filiform, multiarticulate.

MACRONEMA Pictet.

Spurs arranged 2, 2, 4; ocelli absent; antennæ extremely long; the second article of the maxillary palpi longer than the first, the fifth extremely long; intermediate feet of the females dilated.

1. M. pallidum!

Leptonema pallida Guérin, Icon. Regn. Anim. Texte. 396; Walk. Catal. 78, 1.—*Macronema albovirens* Walk.! Catal. 76, 9.

Pale testaceous, almost unclothed; antennæ pale, slightly annulated with fuscous; palpi, head, thorax, abdomen and feet pale testaceous; wings pale, anterior ones hardly clothed with testaceous hair, veins pale. Male and female.

Length to tip of wings 18 millim. Alar expanse 34 millim.

Hab. Vera Cruz, Mexico (Sallé); Cordova (Saussure); Venezuela (Appun); Brazil (Classen).

2. M. chalybeum!

Macronema chalybeum Hagen!

Blackish-fuscous; antennæ black, the basal article orange; head orange, each side anteriorly with an oblique fuscous line; palpi black; thorax rufous, the disk fuscous; feet bright sulphureous; abdomen luteous; anterior wings blackish-fuscous, nude, with a steel-blue reflection, veins with golden hair; posterior wings fuscous. Male.

Length to tip of wings 13 millim. Alar expanse 25 millim.

Hab. Cuba (Poey).

3. M. aeneum!

Macronema aeneum Hagen!

Fuscous; antennæ, ? basal article fulvous; palpi fuscous; head fulvous; thorax fulvous, each side with a fuscous stripe; abdomen luteous; tibiæ fulvous, all the tarsi and the posterior tibiæ fuscous; anterior wings nude, fuscous, with a brilliant brazen reflection, veins fuscous; posterior wings fuscous. Female.

Length to tip of wings 12 millim. Alar expanse 23 millim.

Hab. Mexico (Sallé).

May it not be the female of the preceding? The specimen is mutilated.

4. M. flavum!

Macronema flavum Hagen!

Yellow, pale; antennæ yellow, slightly annulated with fuscous; palpi, head, thorax, feet, and abdomen pale yellow; anterior wings yellow, subnude, a little clothed with golden hair, veins and cilia yellow; posterior wings whitish-yellow, ciliated with pale. Male.

Length to tip of wings 9 millim. Alar expanse 17 millim.

Hab. St. Louis, Missouri (Osten Sacken).

5. M. zebratum!

Macronema zebratum Hagen!

Brassy-fuscous, spotted with yellow; antennæ black, head, thorax and abdomen brassy-fuscous; palpi yellow; feet yellow, the anterior tibiæ and base of the femora a little infuscated; posterior tibiæ with long, yellow spines; anterior wings subnude, yellow, with longitudinal stripes at base, and transverse ones on the disk,

fuscous; the apex fuscous, with an orbicular, yellow spot; posterior wings cinereous, the anterior margin and pterostigma yellow. Male and female.

Var. Anterior wings less spotted, the basal stripes shorter, the disk spotted, and the apex with an incurved band, which has the open side inwards, fuscous.

Hab. St. Lawrence River, Canada; Washington; Virginia (Osten Sacken); Maryland; Niagara Falls; immensely common upon the foliage of trees on Goat Island (Uhler).

I possess a very small specimen from Washington, only 11 millim. long; but it is not different. Sometimes the bands of the wings are almost altogether confluent.

6. M. cupreum!

Macronema cuprea Walk. Catal. 76, 8.

Fuscous; antennæ fuscous, with the base luteous, the incisures fuscous; face, palpi and feet luteous; head and thorax fuscous, partly clothed with golden pile; anterior wings luteo-fuscous, with golden hair, before the apex clouded with black; posterior wings luteo-cinereous, the anterior margin luteous.

Length to tip of wings 17—20 millim. Alar expanse 32—34 millim.

Hab. Mexico (Deppe); Brazil.

I saw a male and female from Mexico in the Berlin Museum (immature specimens), the wings were luteo-fuscous, the golden pile was almost wanting or rubbed off; the other specimens from Brazil are not different.

Does *M. auripenne*, Rambur, differ from this species?

HYDROPSYCHE Pictet.

Spurs arranged 2, 4, 4; antennæ rather long, slender; ocelli absent; second article of the maxillary palpi long, the fifth equal to all of the others together; intermediate feet of the female dilated.

1. H. scalaris!

Hydropsyche scalaris Hagen!

Black-gray, with white hair; antennæ luteous, the base obliquely striated with black, the first article with snow-white hair; head

grayish-fuscous, with snow-white hair; thorax grayish-fuscous, with a broad, medial stripe of white hair; eyes of the male larger, approximated; palpi luteo-fuscous; abdomen fuscous; feet pale luteous; anterior wings blackish-gray, densely flecked with white; veins black; posterior wings cinereous, luteous at base. Male and female.

Length to tip of wings 13 millim. Alar expanse 25 millim.

Hab. St. Lawrence River, Canada (Osten Sacken); Washington. I possess a male from N. Red River (Kennicott) which is extremely like this, but the eyes are larger, more approximate, the front hardly broader than the eyes. Is it different?

2. H. morosa!

Hydropsyche morosa Hagen!

Luteo-fuscous, with luteous hair; antennæ luteous yellow, annulated with fuscous; palpi fuscous; head and thorax luteo-fuscous, with luteous hair; feet luteous; abdomen fuscous; anterior wings luteo-fuscous, densely guttated with luteous, veins luteo-fuscous; posterior wings luteo-cinereous. Male and female.

Length to tip of wings 10—13 millim. Alar expanse 19—25 millim.

Hab. St. Lawrence River, Canada; Washington (Osten Sacken); N. Red River (Kennicott); Trenton Falls, New York (Osten Sacken).

3. H. phalerata!

Hydropsyche phalerata Hagen!

Fuscous, with luteous hair; antennæ fuscous, annulated with luteous; palpi and feet luteous; head and thorax fuscous, with luteous hair; anterior wings fuscous, guttated with luteous, with larger spots at the base, pterostigma and anal angle; veins fuscous; posterior wings blackish-gray. Male and female.

A variety has the anterior wings less spotted, the female obscurer.

Length to tip of wings 7—10 millim. Alar expanse 13—19 millim.

Hab. St. Lawrence River, Canada; Washington (Osten Sacken); Pennsylvania (Zimmerman).

4. H. alternans.

Philopotamus alternans Walk.! Catal. 104, 8.

Black, with hoary hair; base of the antennæ fulvous; feet and apices of the abdominal segments fulvous; anterior wings fuscous, closely irrorated with hoary; posterior wings cinereous. (From the description of Walker.)

Length to tip of wings 12 millim. Alar expanse 23 millim.

Hab. St. Martin's Falls, Albany River, Hudson's Bay (Barnston).

5. H. indecisa.

Philopotamus indecisus Walk.! Catal. 104, 9.

Blackish, beneath testaceous, antennæ testaceous, annulated with fuscous; palpi testaceous, fulvous at base; feet testaceous; anterior wings cinereous, closely guttated with yellow. (From the description of Walker.)

Length to tip of wings 12 millim. Alar expanse 23 millim.

Hab. St. Martin's Falls, Albany River, Hudson's Bay (Barnston); Nova Scotia (Redman).

Is this *H. morosa*?

6. H. reciproca.

Philopotamus reciprocus Walk.! Catal. 104, 10.

Blackish; antennæ and feet testaceous; palpi ferruginous, with the base black; anterior wings subfuscous, closely irrorated with yellow; posterior wings pale fuscous. (From the description of Walker.)

Length to tip of wings 14 millim. Alar expanse 27 millim.

Hab. North America?

It is very much like *H. indecisa.*

7. H. dubia.

Hydropsyche dubia Walk.! Catal. 112, 33.

Black, beneath testaceous; antennæ pale testaceous, annulated with fuscous, the apex fuscous; palpi ferruginous; feet testaceous; anterior wings subfuscous, obsoletely irrorated; posterior wings subcinereous. (From the description of Walker.)

Length to tip of wings 11 millim. Alar expanse 23 millim.

Hab. North America?

8. H. dubitans.

Hydropsyche dubitans Walk.! Catal. 113, 34.

Piceous, with pale hair; antennæ testaceous, the apex black; pectus ferruginous; palpi, feet and apices of the abdominal segments testaceous; wings cinereous, the anterior ones with fuscous hair and some paler spots, composed of yellow pile. (From the description of Walker.)

Length to tip of wings 11 millim. Alar expanse 23 millim.

Hab. North America (Doubleday).

9. H. maculicornis.

Hydropsyche maculicornis Walk.! Catal. 113, 36.

Blackish, hairy; antennæ testaceous, annulated with fuscous; palpi pale; pectus ferruginous; feet testaceous; anterior wings fusco-cinereous, with obsolete irrorations; posterior wings cinereous. (From the description of Walker.)

Length to tip of wings 8 millim. Alar expanse 15 millim.

Hab. St. Martin's Falls, Albany River, Hudson's Bay (Barnston).

10. H. robusta.

Hydropsyche robusta Walk.! Catal. 114, 37.

Ferruginous, hairy; antennæ, palpi and feet testaceous; thorax bivittated with piceous; wings cinereous, somewhat covered with yellow hair; the anterior wings with pale spots, which are clearer at the margin. (From the description of Walker.)

Length to tip of wings 8 millim. Alar expanse 17 millim.

Hab. North America?

11. H. transversa.

Hydropsyche transversa Walk.! Catal. 114, 38.

Testaceous; antennæ black, testaceous at base; abdomen black, apices of the segments pale; feet white; wings whitish, the anterior ones on the front margin and at the veins, yellow, with numerous, transverse cinereous spots, part of which are confluent; the apex subcinereous, spotted with pale; veins pale yellow. (From the description of Walker.)

Length to tip of wings 13 millim. Alar expanse 25 millim.

Hab. Georgia (Abbot).

12. H. chlorotica!

Hydropsyche chlorotica Hagen!

Pale ochreous, with ochreous hair; antennæ ochreous at base, annulated with fuscous, the apex fuscous; palpi fuscous; feet luteous; head and thorax luteo-fuscous, with luteous hair; abdomen luteous; anterior wings ochreous, the anal angle and apical margin ciliated with fuscous; posterior wings cinereous. Male and female.

Length to tip of wings 10—12 millim. Alar expanse 19—23 millim.

Hab. St. Lawrence River, Canada; Chicago; Trenton Falls (Osten Sacken); N. Red River (Kennicott).

13. H. depravata!

Hydropsyche depravata Hagen!

Blackish-fuscous; antennæ blackish-fuscous, the base annulated with luteous; palpi blackish-fuscous; head, thorax and abdomen fuscous; feet brownish-luteous; anterior wings blackish-fuscous, obsoletely irrorated with luteous; posterior wings blackish-gray. Female.

Length to tip of wings 12 millim. Alar expanse 23 millim.

Hab. Dalton, Georgia (Osten Sacken).

One specimen only, which is not fully unfolded.

14. H. sordida!

Hydropsyche sordida Hagen!

Blackish-fuscous; antennæ and palpi fuscous; head and thorax blackish-fuscous, with luteous hair; feet luteo-fuscous, femora fuscous; anterior wings blackish-fuscous, with fuscous hair; posterior wings blackish. Male and female.

Length to tip of wings 8 millim. Alar expanse 15 millim.

Hab. St. Lawrence River, Canada (Osten Sacken); Washington (id.).

15. H. incommoda!

Hydropsyche incommoda Hagen!

Luteous, with luteous hair; antennæ, palpi and feet luteous; head and thorax luteous, with luteous hair; anterior wings luteous, with luteous veins, and obsoletely irrorated with brownish-gray,

especially at the pterostigma; posterior wings luteous; posterior tibiæ ciliated. Male.

Length to tip of wings 10 millim. Alar expanse 19 millim.

Hab. Georgia (Collection of Hagen).

16. H. bivittata!

Hydropsyche? bivittata Hagen!

Black, with black hair; antennæ pale whitish-yellow; palpi luteo-fuscous; feet whitish, the four posterior femora, tibiæ, and the apices of the tarsi brownish-black; wings black, the anterior ones with black hair, and two white, transverse streaks, the apical one interrupted.

Length to tip of wings 6 millim. Alar expanse 11 millim.

Hab. Panama. The specimen is mutilated;—does it belong to this genus?

PHILOPOTAMUS Leach.

Spurs arranged 2, 4, 4; ocelli three.

1. P. confusus.

Philopotamus confusus Walk.! Catal. 103, 7.

Black, with hoary pile; base of the antennæ annulated with testaceous; abdomen beneath, palpi and feet testaceous; wings cinereous, the anterior ones obsoletely irrorated with pale. (From the description of Walker.)

Length to tip of wings 12 millim. Alar expanse 23 millim.

Hab. Arctic America; Slave and Mackenzie Rivers (Richardson).

2. P. distinctus.

Philopotamus distinctus Walk.! Catal. 104, 11.

Black, with black and yellow hair; antennæ much longer than the body; palpi and feet testaceous; anterior wings brownish-gray, closely guttated with yellow. (From the description of Walker.)

Length to tip of wings 6 millim. Alar expanse 11 millim.

Hab. Trenton Falls, New York (Doubleday).

Does the apterous female of *Philopotamus* observed by Doubleday at the same place belong here? See Entomol. Mag. v. 279.

POLYCENTROPUS Curtis.

Spurs arranged 3, 4, 4; ocelli absent; female with the intermediate feet dilated; antennæ thick, rather short.

1. P. validus.

Polycentropus validus Walk.! Catal. 100, 10.

Blackish, with yellow hair, beneath ferruginous; maxillary palpi testaceous, the first article black; antennæ stout, fulvous; feet testaceous; wings cinereous, with yellow pubescence. (From the description of Walker.)

Length to tip of wings 8 millim. Alar expanse 15 millim.

Hab. United States (Doubleday).

2. P. crassicornis.

Polycentropus crassicornis Walk.! Catal. 101, 11.

Ferruginous, densely clothed with yellow hair, beneath testaceous; antennæ stout, fulvous; palpi and feet testaceous; wings cinereous, the anterior ones with yellow pubescence and irroration. (From the description of Walker.)

Length to tip of wings 7—9 millim. Alar expanse 13—16 millim.

Hab. Georgia (Abbot).

A variety has the anterior wings immaculate.

3. P. invarius.

Polycentropus invarius Walk.! Catal. 101, 12.

Fulvous, with golden hair; vertex and disk of the thorax black; antennæ black, the base fulvous; feet testaceous; anterior wings subfuscous, with ferruginous veins; posterior wings cinereous. (From the description of Walker.)

Length to tip of wings 9 millim. Alar expanse 16 millim.

Hab. Nova Scotia (Redman).

4. P. crepuscularis.

Brachycentrus crepuscularis Walk.! Catal. 87, 6.

Black, with luteous hair; antennæ testaceous, obsoletely annulated with fuscous, the apex black; apices of the abdominal segments, and the legs testaceous; wings cinereous, the anterior ones

with testaceous pubescence, veins fulvous. (From the description of Walker.)

Length to tip of wings 9 millim. Alar expanse 16 millim.

Hab. St. Martin's Falls, Albany River, Hudson's Bay (Barnston).

5. P. vestitus.

Polycentropus vestitus Hagen!

Luteo-fuscous, with fuscous hair; antennæ yellow, a little annulated with fuscous; palpi luteous; feet luteo-fuscous, the tarsi obsoletely annulated with yellow; head and thorax with fuscous hair; the disk with yellow hair; anterior wings fuscous, with fuscous hair; posterior wings black. Male.

Length to tip of wings 7 millim. Alar expanse 13 millim.

Hab. Washington (Osten Sacken).

6. P. cinereus!

Polycentropus cinereus Hagen!

Fuscous, with fuscous and whitish hair; antennæ fuscous, annulated with white; palpi luteous, head with white hair, occiput each side with fuscous hair; disk of the thorax with white hair; feet luteo-fuscous, the femora luteous; abdomen fuscous, beneath pale; anterior wings fuscous, with fuscous veins, and closely guttated with white; posterior wings blackish-gray, ciliated with black. Male and female.

Length to tip of wings 8—10 millim. Alar expanse 15—19 millim.

Hab. St. Lawrence River, Canada (Osten Sacken).

7. P. confusus!

Polycentropus confusus Hagen!

Fuscous, with luteous hair; antennæ yellow, annulated with fuscous; palpi fuscous, annulated with pale; disk of the head with luteous hair; feet luteo-fuscous; abdomen fuscous; the apex in the female triangular, acute; the anterior wings fuscous, closely guttated with yellow; posterior wings brownish-cinereous. Male and female.

Length to tip of wings 8—10 millim. Alar expanse 15—19 millim.

Hab. Trenton Falls (Osten Sacken); Washington (id.).

8. P. lucidus!

Polycentropus lucidus Hagen!

Luteous, subnude; antennæ luteo-fuscous, obsoletely annulated; palpi luteous; head and thorax luteo-fuscous, prothorax yellow; feet luteous; wings fusco-hyaline, with fuscous veins, the anterior ones subnude, in part a little clothed with luteous pile. Male.

Length to tip of wings 7 millim. Alar expanse 13 millim.

Hab. Trenton Falls (Osten Sacken); Pennsylvania (Zimmerman).

The specimen may have been defaced, and is possibly immature.

PSYCHOMYIA Latreille.

Spurs arranged 2, 4, 4; second, third and fourth articles of the maxillary palpi equal, longer than the first; wings rather acute, narrow; ocelli absent; apex of the abdomen of the female acute, recurved.

1. P. flavida!

Psychomyia flavida Hagen!

Yellow, with ochreous hair; antennæ whitish, with obsolete annulations; palpi and feet whitish; head and thorax luteous; anterior wings yellow, with dense ochreous hair and cilia; posterior wings cinereous, acute, with cinereous hair.

Length to tip of wings 5 millim. Alar expanse 9 millim.

Hab. St. Lawrence River, Canada (Osten Sacken); Washington (id.).

2. P. parva.

Hydroptila? parva Walk.! Catal. 134, 12.

Testaceous; dorsum of the abdomen piceous; wings whitish. (From the description of Walker.)

Length to tip of wings 4 millim. Alar expanse 6 millim.

Hab. St. Martin's Falls, Albany River, Hudson's Bay (Barnston).

The type is very much mutilated; it certainly is not an *Hydroptila*. Does it belong to this genus?

TINODES Stephens.

Spurs arranged 2, 4, 4; ocelli absent, the third article of the maxillary palpi longer than the others, almost equal to the fifth; apex of the abdomen of the female acute, recurved.

1. T. livida!

Tinodes? livida Hagen!

Luteous, with gray hair; antennæ luteous; palpi luteo-fuscous; feet pale, the anterior ones luteous; head and thorax luteo fuscous, with luteous hair; anterior wings gray, with gray hair and an anal luteous spot; posterior wings grayish hyaline. Female.

Length to tip of wings 8 millim. Alar expanse 15 millim.

Hab. St. Lawrence River, Canada (Osten Sacken).

Does it belong to this genus?

2. T. hirtipes.

Tinodes? hirtipes Curtis, Append. to Sir John Ross's Second Voyage. Wiegmann's Archiv. Zool. II, 1, 288.

Grayish-piceous; wings pale fuscous; it has the *habitus* of a *Tinodes*, but the reticulation is different; posterior tibiæ with only two spurs.

Alar expanse 19 millim.

Hab. Arctic America.

Is it a *Tinodes?*

Sub-Fam. RHYACOPHILIDES.

Maxillary palpi with the last article entire, straight, shorter than the rest.

RHYACOPHILA Pict.

Spurs arranged 3, 4, 4; three ocelli.

1. R. fuscula.

Neuronia fuscula Walk.! Catal. 10, 12.

Ferruginous, partly with black hair, beneath testaceous; thorax each side with a subfuscous spot; feet testaceous, apex of the anterior tibiæ fuscous; wings cinereous, the anterior ones irrorated

with whitish and with many marginal guttæ. (From the description of Walker.)

Length to tip of wings 13 millim. Alar expanse 25 millim.

Hab. St. Martin's Falls, Albany River, Hudson's Bay (Barnston).

It is allied to *R. vulgaris* Pict.

2. R. torva!

Rhyacophila torva Hagen!

Rufo-fuscous; antennæ and palpi rufo-fuscous; head and thorax brownish-black; feet testaceous; abdomen luteous; wings fusco-hyaline, with fuscous veins; anterior ones with dense luteous guttæ. Male.

Length to tip of wings 10 millim. Alar expanse 19 millim.

Hab. Washington; Trenton Falls (Osten Sacken).

BERAEA Stephens.

Spurs arranged 2, 4, 4; palpi densely pilose; the first article of the antennæ thick, pilose; no ocelli.

1. B. maculata!

Beraea? maculata Hagen!

Black, with black hair; antennæ yellow, the base, middle and apex blackish-fuscous; palpi fuscous; feet whitish, annulated with black; abdomen pale beneath; anterior wings black, with black hair and cilia, with two white, transverse apical lines, and the apex pointed with white; posterior wings black, the anterior at the apex emarginated.

Length to tip of wings 4 millim. Alar expanse $7\frac{1}{2}$ millim.

Hab. St. Lawrence River, Canada (Osten Sacken).

Does it belong to this genus?

2. B. viridiventris.

Phryganea viridiventris Say, West. Quart. Report. II, 160, 1.

Pale fuscous, with cinereous hair; antennæ pale fuscous, the base whitish; feet, head, and thorax beneath, white; abdomen green; the anterior wings blackish, ciliated, beyond the middle with a few whitish spots, somewhat arranged in two bands;

posterior wings black; intermediate tarsi dilated. (From the description of Say.)

Length to tip of wings 4 millim. Alar expanse 7½ millim.

Hab. Cincinnati, Ohio River, May; common (Say).

Is this not B. *maculata?*

CHIMARRHA Leach.

Spurs arranged 2, 4, 4; basal joint of the maxillary palpi short, the others longer, equal; three ocelli.

1. C. aterrima!

Chimarrha aterrima Hagen!

Deep black, with black hair; body, antennæ, palpi and feet black, the front with hardly hoary hair; anterior wings with black hair. Male and female.

Length to tip of wings 6—8 millim. Alar expanse 11—15 millim.

Hab. Pennsylvania; Washington; Dalton, Georgia; St. Lawrence River, Canada (Osten Sacken).

2. C. socia!

Chimarrha socia Hagen!

Blackish-fuscous, with fuscous hair; antennæ blackish-fuscous; palpi and feet luteous; head and thorax blackish-fuscous, with luteous hair; anterior wings blackish-fuscous, with fuscous hair, and black cilia; posterior wings blackish-hyaline.

Length to tip of wings 6 millim. Alar expanse 11 millim.

Hab. Washington (Osten Sacken).

3. C. obscura.

Beraea obscura Walk.! Catal. 121, 4.

Blackish, with fuscous hair; thorax and abdomen ferruginous; feet testaceous; antennæ black; wings brownish-black, ciliated. (From the description of Walker.)

Length to tip of wings 4¼ millim. Alar expanse 8 millim.

Hab. St. Martin's Falls, Albany River, Hudson's Bay (Barnston).

Does it belong to this genus?

4. C. pulchra!

Chimarrha pulchra Hagen!

Brownish-black, with golden hair; antennæ and palpi brownish-black; head and thorax orange, with golden hair; abdomen testaceous; feet brownish-black, the posterior femora testaceous; anterior wings brownish-black, with a longitudinal, broad, golden stripe, which is a little incurved towards the apex, at the anterior margin reaching to the pterostigma; posterior wings black.

Length to tip of wings 8—10 millim. Alar expanse 15—19 millim.

Hab. Cuba (Poey, Osten Sacken).

Ptilostomis kowalewskii Kol., from North America, Wien. Ent. Zeit. 1859, p. 21 (a new genus separated from *Rhyacophila*), is noticed only by name. It is unknown to me.

LIST

OF

SOUTH AMERICAN NEUROPTERA.

Fam. I. TERMITINA.

Calotermes Hagen.

castaneus! (Compare North Am. Neur.).
Hab. Columbia, Venezuela; Brazil, Rio, St. Leopold; Chile.

nodulosus! *Calotermes nodulosus* Hagen, Linnæa, XII, 61, 11; pl. ii, fig. 4.
Hab. Brazil, St. Joâo del Rey.

rugosus! *Calotermes rugosus* Hagen, Linnæa, XII, 63, 12; pl. iii, fig. 4.
Hab. Brazil, Constancia near Rio.

brevis! (See North Amer. Neur.).
Hab. St. Fe de Bogota; Brazil.

serrifer! *Calotermes serrifer* Hagen, Linnæa, XII, 72, 19; pl. i. fig. 6.
Hab. Santarem (Bates).

Hodotermes Hagen.

quadricollis! *Termes quadricollis* Rbr.! Neuropt. 304, 4. Linnæa, XII, 101, 12; pl. i. fig. 10. *Termes chilensis* Gay! Fn. Chil. Neuropt. pl. i. fig. 1—3. *Termes pallidus* Walk.! Catal. Br. Mus. 504, 2.
Hab. Chili (Gay).

Termes Linné.

dirus! *Termes dirus* Burm.! Hdb. II, 766, 8. Ramb.! Neuropt. 307, 13. Walk.! Catal. Br. Mus. 510, 9. Hagen! Peters' Reise Mozambique, II, 83; pl. iv, fig. 1—8. Linnæa! XII, 151, 14; pl. i. fig. 7; pl. ii, figs. 16, 17; pl. iii, figs. 17, 37—40. *T. flavicollis* Perty! Delect. 128, pl. xxv, figs. 11, 13. *T. fatalis* Perty! Delect. 127, pl. xxv, fig. 8. *Termes costatus* Ramb.! Neuropt. 305, 9. *Termes obscurum* Blanchard, Hist. Ins. pl. xlvii, fig. 1. Westwood! Introd. II, 12, fig. 58, 1. (*Soldier.*) *Termes spinosum* Latr.! Hist. Nat. XIII, 70, 8. Dictionn. d'hist. Nat. XXII, 63. *Termes dubius* Ramb.! Neuropt. 309, 17.
Hab. Guiana; Brazil, Amazon, Carçara, Rio, Congonhas, Lagoa Santa (Burmeister).

grandis! *Termes grandis* Ramb.! Neuropt. 306, 10. Walk. Catal. Br. Mus. 519, 20. Hagen! Linnæa, XII, 157, 15; pl. ii, fig. 10; pl. iii, fig. 18. *Termes decumanus* Erichs.! Schomburgk, Reise Guiana, III, 582, 1. *Termes costatus* Walk. Catal. Br. Mus. 518, 19. *Termes fuscum* Latr.? Hist. Nat. XIII, 68, 2. Dictionn. d'hist. Nat. XXII, 60.
Hab. Cayenne; British Guiana.

molestus! *Termes molestus* Burm.! Hdb. II, 766, 9. Walk. Catal. Br. Mus. 512, 10. Hagen! Linnæa, XII, 159, 16, pl. iii. fig. 19.
Hab. Brazil; Amazon.

nigricans! *Termes nigricans* Ramb.! Neuropt. 308, 14. Walk. Catal. Br. Mus. 519, 23. Hagen! Linnæa, XII, 162, 18. *Termes trinervius* ? Hagen, Peters' Reise Mozamb. II, 85. *Termes destructor* Fabr.? Entom. Syst. II, 89, 2. *Termes cephalotes* Ramb.? Neuropt. 309, 18.
Hab. Brazil.

cumulans! *Termes cumulans* Kollar! Pohl's Reise Brazil. I, 111, fig. 9. Kollar! Brazil. laestige Insect. 13, fig. 9. Hagen! Linnæa, XII, 165, 19; pl. ii, fig. 11; pl. iii, fig. 20. *Termes Americanus* Rengger? Reise Paraguay. *Termes pallidipennis* Blanchard? Voyage d'Orbigny.
Hab. Brazil, Ypanema; Barra do Rio Negro (Natterer).

similis! *Termes similis* Hagen! Linnæa, XII, 167, 20; pl. i, fig. 5; pl. iii, fig. 21.
Hab. Brazil, Lagoa Santa, Congonhas (Burmeister); Para.

striatus! *Termes striatus* Hagen! Linnæa, XII, 171, 21.
Hab. Brazil.

cingulatus! *Termes cingulatus* Burm.! Hdb. II, 767, 13. Walk. Catal. Br. Mus. 515, 14. Hagen! Linnæa, XII, 187, 28; pl. i, fig. 13; pl. iii, fig. 24.
Hab. Brazil, Porto Allegro; British Guiana (Schomburgk).

marabitanas! *Termes marabitanas* Hagen! Linnæa, XII, 191, 29; pl. i, fig. 4; pl. iii, fig. 25.
Hab. Brazil, St. Jose de Marabitanas (Natterer).

tenebrosus! *Termes tenebrosus* Hagen! Linnæa, XII, 193, 30.
Hab. Brazil, Ypanema, New Friburg, near Rio.

ater! *Termes ater* Hagen! Linnæa, XII, 195, 31; pl. iii, fig. 26. *Termes morio* Walk.! Catal. Br. Mus. 514, 12.
Hab. Brazil, New Friburg (Burmeister); Columbia.

opacus! *Termes opacus* Hagen! Linnæa, XII, 196, 32; pl. iii, fig. 27; pl. i, fig. 19.
Hab. Brazil, Lagoa Santa, Congonhas (Burmeister); Para; Cassapava.

testaceus! *Hemerobius testaceus* Linné! Syst. Nat. X, 550, 6; XII, 912, 8; XIII, 2641, 8. *Termes testaceus* Burm.! Hdb. II, 767, 10. Hagen! Linnæa, XII, 198, 33; pl. ii, fig. 12; pl. iii, fig. 28. *Termes morio* Fabr. Entom. Syst. II, 90, 3. Ramb.! Neuropt. 305, 7. Erichs.! Reise Guiana Schomburgk. III, 582, 2. *Termes nasutus* Walk.! Catal. Br. Mus. 506, 5. *Perla fusca* Degeer! Mém. III, 567, 1; pl. xxvii, figs. 4, 5. Retzius, 60, 205.
Hab. Surinam; Cayenne; British Guiana; Venezuela, Puerto Cabello; Brazil, Para; Chili, Valparaiso; Santarem.

morio! (See Catal. North Amer. Neuropt.)
HAB. Venezuela; Brazil, Santarem (Bates).

simplicinervis! *Termes simplicinervis* HAGEN! Linnæa, XII, 204, 35.
HAB. Brazil, Santarem (Bates).

debilis! (See North Amer. Neuropt.)
HAB. Brazil, Congonhas (Burmeister).

exiguus! *Termes exiguus* HAGEN! Linnæa, XII, 208, 39.
HAB. Brazil, Santarem (Bates).

trispinosus! *Termes trispinosus* HAGEN! Linnæa, XII, 210, 41; pl. i, fig. 11.
HAB. Brazil, Santarem (Bates) Miles.

rippertii! (See North Amer. Neuropt.)
HAB. Columbia; Brazil, New Friburg; Ypanema.

arenarius! *Termes arenarius* HAGEN! Linnæa, XII, 222, 50. *Termes testaceus* WALK.! Catal. Br. Mus. 513, 11.
HAB. Brazil, Santarem (Bates).

albidus! *Termes albidus* HAGEN! Linnæa, XII, 225, 51; pl. iii. 34.
HAB. Brazil, Santarem (Bates).

devastans! *Termes devastans* KOLLAR! Pohl's Reise Brasil. I, fig. 8. KOLLAR! Brasil. laestig. Insect. 13, fig. 8. HAGEN! Linnæa, XII, 229, 54.
HAB. Brazil, Rio.

tenuis! (See North Amer. Neuropt.)
HAB. Brazil.

marginalis! *Hemerobius marginalis* LINNÉ! Syst. Nat. X, 550, 7; XII, 912, 9. *Termes marginalis* HAGEN! Linnæa, XII, 234. *Perla nasuta* DE GEER! Mém. III, 568; pl. xxvii, fig. 6, 7. RETZIUS, 60, 206. *Termes nasutum* LATR. Hist. Nat. XIII, 69, 4. Dictionn. d'hist. Nat. XXII, 61. BURM.! Hdb. II, 764, 4.
HAB. Surinam.

nasutus! *Termes nasutum* PERTY! Delect. 127, pl. xxv, fig. 10. HAGEN! Linnæa, XII, 237, 59, pl. ii, fig. 14; pl. iii, fig. 1.
HAB. Brazil.

FAM. II. EMBIDINA.

Olyntha Gray.

brasiliensis. *Olyntha Brasiliensis* GRAY! Griff. Anim. Kingd. XV, 347; pl. lxxii, fig. 2. WESTW.! Trans. Linn. Soc. XVII, 373; pl. ii, fig. 3. BURM. Hdb. II, 770, 1. WALK.! Catal. Br. Mus. 532, 1.
HAB. Brazil.

ruficapilla. *Olyntha ruficapilla* BURM. Hdb. II, 770, 2. WALK. Catal. Br. Mus. 532, 2.
HAB. Brazil, Venezuela?

klugii. *Embia Klugii* RAMB. Neuropt. 313, 3. WALK. Catal. Br. Mus. 530, 3.
HAB. Brazil.

Olyntha staphilinoides WALK.! Catal. Br. Mus. 532, 3, from Brasil. Is it *Forficula?*

Fam. III. PSOCINA.

Thyrsophorus Burmeister.

speciosus! *Thyrsophorus speciosus* Burm.! Hdb. II, 782, 1. Walk. Catal. Br. Mus. 478, 1. *Thyrsophorus spinolae* Rbr.! Neuropt. 318, 1. Walk.! Catal. Br. Mus. 479, 3.
Hab. Brazil, Para.

pennicornis! *Thyrsophorus pennicornis* Burm.! Hdb. II, 782, 2. Walk. Catal. Br. Mus. 478, 2. *Thyrsophorus ramosus* Walk.! Catal. Br. Mus. 480, 5.
Hab. Brazil, Bahia, Para.

leucotelus. *Thyrsophorus leucotelus* Walk.! Catal. Br. Mus. 479, 4.
Hab. Brazil, Para.

anticus. *Thyrsophorus anticus* Walk.! Catal. Br. Mus. 480, 6.
Hab. Brazil, Para.

Psocus Latreille.

fuscipennis! *Psocus fuscipennis* Burm.! Hdb. II, 778, 9. Walk. Catal. Br. Mus. 484, 8.
Hab. Brazil.

opacus! *Psocus opacus* Hagen, Collect.
Hab. Brazil.

sticticus! *Psocus sticticus* Hagen, Collect.
Hab. Brazil.

albicinctus! *Psocus albicinctus* Hagen, Collect.
Hab. Brazil.

lepidus! *Psocus lepidus* Hagen, Collect.
Hab. Brazil.

quadrisignatus! *Psocus quadrisignatus* Hagen, Collect.
Hab. Brazil.

pictus! *Psocus pictus* Hagen, Collect.
Hab. Brazil.

marginatus! *Psocus marginatus* Hagen, Collect.
Hab. Brazil.

Fam. IV. PERLINA.

Perla Geoffroy.

nubes. *Perla nubes* Pict. Perl. 174, 9; pl. ix, fig. 7, 8. Walk. Catal. Br. Mus. 145, 14.
Hab. America.

braziliensis. *Perla braziliensis* Pict. Perl. 216, 24; pl. xviii, fig. 3. Walk. Catal. Br. Mus. 151, 36.
Hab. Brazil.

intermixta. *Perla intermixta* Walk.! Catal. Br. Mus. 153, 42.
Hab. Venezuela.

luteicollis. *Perla luteicollis* Walk.! Catal. Br. Mus. 154, 46.
Hab. Venezuela.

repanda! *Perla repanda* Hagen, Collect.
Hab. Chili.

bifasciata! *Perla bifasciata* Pict.! Perl. 229, 30; pl. xx, fig. 5. Walk. Catal. Br. Mus. 156, 51.
Hab. Columbia.

signata. *Perla signata* Walk.! Catal. Br. Mus. 157, 54.
Hab. Venezuela.

gayi. *Perla gayi* Pict. Perl. 238, 33; pl. x, fig. 3. Walk. Catal. Br. Mus. 158, 55.
Hab. Chili.

longicauda! *Perla longicauda* Pict. Perl. 236, 34; pl. xxii, fig. 5—8. Walk. Catal. Br. Mus. 158, 57.
Hab. Brazil, New Friburg.

dilaticollis! (See North Amer. Neuropt.)
Hab. Columbia.

hyalina. *Perla hyalina* Pict. Perl. 247, 39; pl. xxi, fig. 5—10. Walk. Catal. Br. Mus. 159, 61.
Hab. Brazil.

annulicauda. (See North Amer. Neuropt.)
Hab. Brazil.

annularis. *Perla annularis* Pict. Perl. 252, 42; pl. xxv, fig. 3—5. Walk. Catal. Br. Mus. 160, 63.
Hab. Brazil.

debilis. *Perla debilis* Pict. Perl. 255, 44; pl. xxvi, fig. 4. Walk. Catal. Br. Mus. 161, 66.
Hab. Brazil.

klugii. *Perla klugii* Pict. Perl. 267, 50; pl. xxv, fig. 1—2. Walk. Catal. Br. Mus. 162, 72.
Hab. Brazil.

obscura. *Perla obscura* Pict. Perl. 269, 51; pl. xxviii, fig. 1—4. Walk. Catal. Br. Mus. 163, 73.
Hab. Brazil.

polita. *Perla polita* Burm. Hdb. II, 879, 6. Pict. Perl. 271, 52; pl. xxviii, fig. 5—9. Walk. Catal. Br. Mus. 163, 74.
Hab. Brazil.

morio! *Perla morio* Pict.! Perl. 272, 53; pl. xxx, fig. 1—5. Walk. Catal. Br. Mus. 163, 75.
Hab. Columbia.

fenestrata! *Perla fenestrata* Pict.! Perl. 281, 57; pl. xxxi, fig. 1—4. Walk. Catal. Br. Mus. 167, 85.
Hab. Columbia.

Capnia Pictet.

cancellata. *Capnia cancellata* Pict. Perl. 328, 4; pl. xli. Walk. Catal. Br. Mus. 175, 4.
Hab. Brazil.

gracilis! *Capnia gracilis* Pict.! Perl. 330, 5; pl. xlii, fig. 1—3. Walk. Catal. Br. Mus. 175, 5.
Hab. Brazil.

Fam. V. EPHEMERINA.

Ephemera Linné.

colombiæ. *Ephemera colombiae* Walk. Catal. 537, 6.
Hab. Columbia.

Palingenia Burmeister.

albicans. *Ephemera albicans* Percheron, Gen. Ins. Livr. VI, Neuropt. pl. vi. *Palingenia albicans* Burm. Hdb. II, 803. Pict. Ephemer. 149, 4; vol. xiii, fig. 1—3. Walk. Catal. 548, 4.
Hab. Brazil.

dorsalis! *Palingenia dorsalis* Burm. Hdb. II, 803, 3. Pictet. Ephemer. 153, 6, tab. xiii, fig. 5. Walk. Catal. 549, 5.
Hab. Brazil.

atrostoma. *Ephemera atrostoma* Weber. Obs. Entom. 99, 1. Pictet. Ephemer. 157. Walk. Catal. 550, 9.
Hab. Brazil.

albifilum. *Palingenia albifilum* Walk.! Catal. 554, 19.
Hab. Para.

curta. *Palingenia curta* Hagen. *Palingenia albifilum* Walk.! var. Catal. 554, 19.
Hab. Para.

latipennis. *Palingenia latipennis* Walk.! Catal. 554, 20.
Hab. Para.

umbrata! *Palingenia umbrata* Hagen, Collect.
Hab. Amazon.

dorsigera! *Palingenia dorsigera* Hagen, Collect.
Hab. Montevideo.

Baëtis Leach.

albivitta. *Baëtis albivitta* Walk. Catal. 566, 33.
Hab. Para.

Cloë Leach.

fasciata! *Cloë fasciata* Pictet. Ephemer. 262, 9; tab. xli, fig. 4. Walk. Catal. 575, 9.
Hab. Brazil.

Oligoneuria Pictet.

anomala! *Oligoneuria anomala* Pict.! Ephemer. 291, tab. xlvi et xlvii. Hagen! Stett. Ent. Zeit. XVI, 269, 2. Walk. Catal. 585, 1.
Hab. Brazil.

Fam. VI. ODONATA.

Tribe I. **AGRIONINA.**

Sub-Fam. I. CALOPTERYGINA.

Lais Hagen.

globifer! *Lais globifer* Hagen! Monogr. Calopt. 88, 28; tab. x, fig. 1. Selys! Synops. 27, 28. Walk. Catal. 613, 1.
Hab. Brazil, New Friburg.

aenea! *Lais aenea* Selys! Monogr. Calopt. 91, 29; tab. x, fig. 2. Selys! Synops. 28, 29. Walk. Catal. 613, 2.
Hab. Para.

cuprea! *Lais cuprea* Selys! Monogr. Calopt. 92, 30; Selys! Synops. 28, 30. Walk.! Catal. 613, 3.
Hab. Brazil, Para.

hyalina! *Lais hyalina* Hagen! Monogr. Calopt. 92, 31. Selys! Synops. 28, 31. Walk. Catal. 613, 4.
Hab. Brazil.

pruinosa! *Lais pruinosa* Hagen! Monogr. Calopt. 93, 32; tab. x, fig. 3. Selys! Synops. 28, 32. Walk. Catal. 615, 5.
Hab. Brazil.

pudica! *Lais pudica* Hagen! Monogr. Calopt. 95, 33; tab. x, fig. 4. Selys! Synops. 29, 33. Walk. Catal. 615, 6.
Hab. Brazil, Ypanema.

Hetaerina Hagen.

simplex! *Hetaerina simplex* Selys! Monogr. Calopt. 98, 34; tab. x, fig. 5. Selys! Synops. 30, 34. Walk. Catal. 616, 7.
Hab. Brazil, Minas Geraës.

sanguinea! *Hetaerina sanguinea* Selys! Monogr. Calopt. 100, 35; tab. x, fig. 6. Selys! Synops. 31, 35. Walk. Catal. 617, 8.
Hab. Para.

rosea! *Hetaerina rosea* Selys! Monogr. Calopt. 102, 36; tab. x, fig. 7. Selys! Synops. 31, 36. Walk. Catal. 617, 9.
Hab. Brazil, Minas Geraës; Chili.

caja! *Libellula caja* Drury, II, 82; tab. xlv, fig. 2. *Calopteryx caja* Burm.! Hdb. II, 826, 5. *Hetaerina caja* Selys! Monogr. Calopt. 104. 37; tab. x, fig. 8. Selys! Synops. 32, 37. Walk. Catal. 618, 10.
Hab. Columbia, Venezuela, Porto Cabello (Appun).

dominula! *Hetaerina dominula* Hagen! Monogr. Calopt. 107, 38; tab. xi, fig. 1. Selys! Synops. 33, 38. *Calopteryx caja* Erichs.! Voyag. Schomburgk, III. Walk. Catal. 619, 11.
Hab. Guiana, Surinam; Brazil.

auripennis! *Calopteryx auripennis* Burm.! Hdb. II, 827, 10. Ramb. Neuropt. 225, 13. *Hetaerina auripennis* Selys! Monogr. Calopt. 109, 39; tab. xi, fig. 2. Selys! Synops. 33, 39. Walk. Catal. 619, 12.
Hab. Brazil, Bahia, Rio.

hebe! *Hetaerina hebe* SELYS! Monogr. Calopt. 112, 40; tab. xi, fig. 3. SELYS! Synops. 34, 40. WALK. Catal. 620, 13.
HAB. Brazil.

sanguinolenta! *Hetaerina sanguinolenta* HAGEN! Monogr. Calopt. 115, 41; tab. xi, fig. 4. SELYS! Synops. 35, 41. WALK. Catal. 621, 14.
HAB. Brazil, Bahia.

mortua! *Hetaerina mortua* HAGEN! Monogr. Calopt. 117, 42; tab. xi, fig. 5. SELYS! Synops. 35, 42. WALK. Catal. 621, 15.
HAB. Guiana.

laesa! *Hetaerina laesa* HAGEN! Monogr. Calopt. 119, 44. SELYS! Synops. 36, 44. WALK. Catal. 622, 17.
HAB. Surinam.

longipes! *Hetaerina longipes* HAGEN! Monogr. Calopt. 121, 45; tab. xi, fig. 7. SELYS! Synops. 37, 45. WALK. Catal. 623, 18.
HAB. Brazil.

carnifex! *Hetaerina carnifex* HAGEN! Monogr. Calopt. 123, 46; tab. xi, fig. 8. SELYS! Synops. 37, 46. WALK. Catal. 624, 19.
HAB. Brazil, New Friburg, Minas Geraës.

proxima! *Hetaerina proxima* SELYS! Monogr. Calopt. 125, 47; tab. xi, fig. 9. SELYS! Synops. 38, 47. WALK. Catal. 624, 20.
HAB. Brazil, Ypanema.

cruentata! (See North American Neuropt.)
HAB. Venezuela, Merida, Paranas de St. Urban; Surinam.

vulnerata! (See North American Neuropt.)
HAB. Columbia, Brazil.

americana! (See North American Neuropt.)
HAB. Brazil.

moribunda! *Hetaerina moribunda* HAGEN! Monogr. Calopt. 134, 154; tab. xii, fig. 4. SELYS! Synops. 42, 51. WALK. Catal. 628, 24.
HAB. Cayenne; Brazil, Para.

occisa! *Hetaerina occisa* HAGEN! Monogr. Calopt. 143, 55; tab. xii, fig. 6. SELYS! Synops. 44, 55. WALK. Catal. 631, 28.
HAB. Columbia, Venezuela, Porto Cabello, Laguayra, Paranas de St. Urban.

brightwelli! *Agrion brightwelli* KIRBY, Trans. Linn. Soc. XIV, 107; tab. iii, fig. 5. *Calopteryx brightwelli* BURM. Hdb. II, 826, 5. *Hetaerina brightwelli* SELYS! Monogr. Calopt. 148, 57; tab. xii, fig. 8. SELYS! Synops. 46, 57. WALK. Catal. 633, 30.
HAB. Brazil, Rio, New Friburg, Irisauga.

majuscula! *Hetaerina majuscula* SELYS! Monogr. 151, 58; tab. xiii, fig. 1. SELYS! Synops. 47, 58. WALK. Catal. 634, 31.
HAB. Columbia; Surinam.

Heliocharis Selys.

amazona! *Heliocharis amazona* SELYS! Monogr. Calopt. 188, 1; tab. xiv, fig. 5. SELYS! Synops. 55, 71. WALK. Catal. 642, 1.
HAB. Brazil, Ega (Bates), Amazon River.

brasiliensis! *Heliocharis brasiliensis* HAGEN! addit. Synops. Calopt. 9, 71, bis.
HAB. Brazil, Bahia.

Dicterias Selys.

atrosanguinea! *Dicterias atrosanguinea* Selys! Monogr. Calopt. 191, 72; tab. xiv, fig. 6. Selys! Synops. 56, 72. Walk. Catal. 643, 2.
Hab. Amazon River (Bates).

procera! *Dicterias procera* Hagen! addit. Synops. Calopt. 10, 72, bis.
Hab. Amazon River, Santarem (Bates).

Amphipteryx Selys.

agrioides! *Amphipteryx agrioides* Selys! Monogr. Calopt. 241, 92. Selys! Synops. 66, 1. Walk. Catal. 654, 1.
Hab. Colombia.

Chalcopteryx Selys.

rutilans! *Chalcopteryx rutilans* Selys! Monogr. Calopt. 251, 94; tab. ix, fig. 7. Selys! Synops. 68, 94. Walk. Catal. 655, 1. *Rhinocypha rutilans* Ramb.! Neuropt. 233, 1.
Hab. Brazil, Para.

Thore Hagen.

gigantea! *Thore gigantea* Selys! Monogr. Calopt. 254, 1. Selys! Synops. 69, 95. Walk. Catal. 656, 2.
Hab. Colombia, Bogota.

picta! *Euphaea picta* Ramb. Neuropt. 231, 4. *Thore picta* Selys! Monogr. Calopt. 256, 96. Selys! Synops. 70, 96. Walk. Catal. 656, 3.
Hab. Cayenne; Para.

saundersii! *Thore saundersii* Selys! Monogr. Calopt. 257, 97. Selys! Synops. 70, 97. Walk. Catal. 657, 4.
Hab. Amazon River; Para.

fasciata! *Thore fasciata* Hagen! Monogr. Calopt. 259, 98; tab. ix, fig. 8. Selys! Synops. 70, 98. Walk. Catal. 657, 5.
Hab. Colombia, Venezuela, Porto Cabello (Appun).

hyalina! *Thore hyalina* Selys! Monogr. Calopt. 261, 99. Selys! Synops. 71, 99. Walk. Catal. 658, 8.
Hab. Bahia.

fastigiata! *Thore fastigiata* Selys! addit. Synops. 16, 99, bis.
Hab. Colombia, Bogota.

Cora Selys.

cyane! *Cora cyane* Selys! Monogr. Calopt. 263, 100. Selys! Synops. 71, 100. Walk. Catal. 658, 7.
Hab. Venezuela, Porto Cabello (Appun).

Sub-Fam. II. AGRIONINA.

Megaloprepus Rambur.

caerulatus! (See the North American Neuropt.) Var. *bolivar* Selys.
Hab. Colombia, Bogota.

Microstigma Rambur.

anomalum! *Microstigma anomalum* Rbr. Neuropt. 289, 1. *Microstigma proximum* Rbr. Neuropt. 289, 2.
Hab. Amazon River, Santarem, Para (Bates), Cayenne.

rotundatum! *Microstigma rotundatum* Selys! Var. *M. exustum* Selys! Var. *M. lunatum* Selys!
Hab. Peru; Amazon River; Para (Bates).

maculatum! *Microstigma maculatum* Hagen!
Hab. Cayenne; Amazon River, Santarem (Bates); Essequibo.

Pseudostigma Selys.

accedens! *Pseudostigma accedens* Selys! (See North Amer. Neuropt.)
Hab. Colombia.

Mecistogaster Rambur.

ornatus! (See North American Neuropt.)
Hab. Venezuela, Caraccas; Surinam; Lima.

astictus! *Mecistogaster astictus* Hagen!
Hab. Brazil, New Friburg.

linearis! *Agrion lineare* Fabr. Entom. Syst. II, 388, 5. *Mecistogaster filigerus* Rbr.! Neuropt. 287, 10, mas. *Mecistogaster signatus* Rbr. Neuropt. 286, 9, fem. *Mecistogaster flavistigma* Ramb. Neuropt. 287, 11 ? fem.
Hab. Guiana; Surinam; Amazon River; Para; Santarem, Colombia.

lucretia! (See North American Neuropt.)
Hab. Brazil, Amazon River.

marchali! *Mecistogaster marchali* Rbr. Neuropt. 283, 2. *Mecistogaster filum* Ramb.! Neuropt. 284, 3. *Mecistogaster pedicellatus* Rambr.! Neuropt. 284, 5.
Hab. Guiana; Surinam; Amazon River; Para.

Lestes Leach.

grandis! (See North American Neuropt.)
Hab. Colombia.

forficula! (See North American Neuropt.)
Hab. Brazil.

undulata! *Lestes undulata* Say, Journ. Acad. Philad. VIII, 35. *Lestes vittata* Hagen! Revue des Odonat. d'Europe, 331.
Hab. Montevideo; Buenos Ayres; Valdivia.

picta! *Lestes picta* Hagen.
Hab. Brazil.

tricolor! *Lestes tricolor* Erichs.! Voyag. Schomburgk, III.
Hab. Guiana; Bahia; Pernambuco.

contorta! *Lestes contorta* Hagen!
Hab. Brazil, New Friburg.

striata. *Lestes striata* Selys.
Hab. Venezuela, Cayenne (not seen by me).

minuta. *Lestes minuta* Selys.
Hab. Brazil (not seen by me).

Hyponeura Selys.

funckii! *Hyponeura funckii* Selys!
Hab. Colombia.

Euclea Selys.

terminalis. *Euclea terminalis* Selys.
Hab. Amazon River (not seen by me).

Podagrion Selys.

oscillans. *Podagrion oscillans* Selys.
Hab. Bogota (not seen by me).
megalopus. *Podagrion megalopus* Selys.
Hab. Amazon River (not seen by me).
macropus. *Podagrion macropus* Selys.
Hab. Venezuela, Merida (not seen by me).
flavovittatum! *Podagrion flavovittatum* Selys!
Hab. Brazil, Minas Geraës.
venale! *Podagrion venale* Hagen!
Hab. Colombia.

Leptogaster Selys.

ovatus. *Leptogaster ovatus* Selys.
Hab. Bahia (not seen by me).
aurantiacus! *Leptogaster aurantiacus* Hagen!
Hab. Brazil.
cinnamomeus! *Leptogaster cinnamomeus* Hagen!
Hab. Bahia.
sordidus. *Leptogaster sordidus* Selys.
Hab. Santarem (not seen by me).
angustus. *Leptogaster angustus* Selys.
Hab. Santarem (not seen by me).

Neoneura Selys.

ciliaris! *Neoneura ciliaris* Selys!
Hab. Brazil; perhaps *N. ancilla*.
bilinearis! *Neoneura bilinearis* Selys!
Hab. Para.
rubriventris! *Neoneura rubriventris* Selys!
Hab. Para.
fragilis! *Agrion fragile* Hagen!
Hab. Brazil, New Friburg.

Sub-gen. *Notosticta* De Selys.

melanostigma! *Neoneura melanostigma* Hagen!
Hab. Venezuela.

Protoneura Selys.

sancta! *Protoneura sancta* Hagen!
Hab. Columbia.
tenuis. *Protoneura tenuis* Selys.
Hab. Para.

Agrion Fabricius.

Sub-gen. *Ischnura* Charpentier.

gracile! *Agrion gracile* Ramb.! Neuropt. 260, 4.
Hab. Brazil, Venezuela.
truncatum. *Agrion truncatum* Selys.
Hab. Minas Geraës, Brazil.
chelifer. *Agrion chelifer* Selys.
Hab. Minas Geraës, Brazil.
tuberculatum! (See North American Neuroptera.)
Hab. Cayenne.
versutum! *Agrion versutum* Hagen!
Hab. Chili.
simile! *Agrion simile* Selys!
Hab. Venezuela, Merida.
rusticum! *Agrion rusticum* Hagen!
Hab. Bahia.
debile! *Agrion debile* Hagen!
Hab. Rio, Brazil.
cinctum! *Agrion cinctum* Hagen!
Hab. Quillota, Chili.
floridum! *Agrion floridum* Hagen!
Hab. Lima.
hastatum! (See North American Neuroptera.)
Hab. Merida.
capreolus! (See North American Neuroptera.)
Hab. Brazil.

Sub-genus (new).

macilentum. *Agrion macilentum* Rbr. Neuropt. 259, 4.
Hab. Brazil.
bicorne. *Agrion bicorne* Selys.
Hab. Para.
bitaeniatum. *Agrion bitaeniatum* Selys.
Hab. Brazil.
longissimum! *Agrion longissimum* Selys.
Hab. Brazil.

Sub-genus (new).

briseis! *Agrion briseis* Hagen!
Hab. Brazil.
elongatum. *Agrion elongatum* Selys.
Hab. Brazil.

porrectum! *Agrion porrectum* HAGEN.
HAB. Brazil.
glaucopis! *Agrion glaucopis* HAGEN!
HAB. Bahia.
iris! *Agrion iris* HAGEN!
HAB. Bahia.
thetis! *Agrion thetis* HAGEN!
HAB. Bahia.
andromache! *Agrion andromache* HAGEN!
HAB. Brazil.
macrurum! *Agrion macrurum* BURM.! Hdb. II, 819, 4.
HAB. Brazil.

Sub-gen. *Pyrrhosoma* CHARPENTIER.

flavipes. *Agrion flavipes* SELYS.
HAB. Brazil.
corallinum. *Agrion corallinum* SELYS.
HAB. Brazil.
coccineum. *Agrion coccineum* SELYS.
HAB. Brazil, Minas Geraës.
erythrinum. *Agrion erythrinum* SELYS.
HAB. Brazil, Minas Geraës.
rubellum. *Agrion rubellum* SELYS.
HAB. Brazil.
rubidum. *Agrion rubidum* RAMB. Neuropt. 261, 8.
HAB. Buenos Ayres.
haematinum! *Agrion haematinum* SELYS!
HAB. Brazil, Minas Geraës.
terminale. *Agrion terminale* SELYS.
HAB. Brazil, Minas Geraës.
vulneratum! (See N. American Neuroptera.)
HAB. Guiana.
sulphuratum! *Agrion sulphuratum* HAGEN!
HAB. Bahia.
croceum! *Agrion croceum* BURM.! Hdb. II, 819, 6.
HAB. Surinam.
rubens. *Agrion rubens* SELYS.
HAB. Brazil.
basale. *Agrion basale* SELYS.
HAB. Brazil.
angustipenne. *Agrion angustipenne* SELYS.
HAB. Brazil, Minas Geraës.
dispar! *Agrion dispar* HAGEN!
HAB. Brazil, Minas Geraës.
filiola! *Agrion filiola* PERTY, Delect. Anim. 125; tab. XXV, fig. 4.
HAB. Brazil, Minas Geraës, Pernambuco, Bahia.
pavidum! *Agrion pavidum* HAGEN!
HAB. Brazil, New Friburg.
rufovittatum. *Agrion rufovittatum* BLANCHARD, Voyag. d'Orbigny.
HAB. Bolivia.

Sub-gen. *Agrion* CHARPENTIER.

dorsale! *Agrion dorsale* BURM.! Hdb. II, 819, 5.
HAB. Brazil.
modestum. *Agrion modestum* SELYS.
HAB. Brazil, Minas Geraës.
sordidum! *Agrion sordidum* HAGEN!
HAB. Brazil, New Friburg.
fissum. *Agrion fissum* SELYS.
HAB. Columbia.
impurum. *Argya impura* RAMB. Neuropt. 255, 1.
HAB. Para.
claussenii! *Agrion claussenii* SELYS!
HAB. Brazil.
oculatum! *Agrion oculatum* HAGEN!
HAB. Venezuela; Pernambuco.
infumatum! *Agrion infumatum* SELYS!
HAB. Para.
serva! *Agrion serva* HAGEN!
HAB. Brazil.
insipidum! *Agrion insipidum* HAGEN!
HAB. Guiana.
incultum! *Agrion incultum* HAGEN!
HAB. Lima.
torvum! *Agrion torvum* HAGEN!
HAB. Quillota.
nuptum! *Agrion nuptum* HAGEN!
HAB. Quillota.
cupreum! (See North American Neuroptera.)
HAB. Venezuela.

Tribe II. **AESCHNINA.**

Sub-Fam. III. GOMPHINA.

Gomphus Leach.

crotalinus! (See North American Neuropt.)
HAB. Brazil.
paludosus! *Epigomphus paludosus* HAGEN! Gomphin. 85, 22.
HAB. Brazil.
molestus! *Hemigomphus molestus* HAGEN! Gomphin. 183, 65.
HAB. Chili.

Gomphoides Selys.

gracilis! *Progomphus gracilis* HAGEN! Gomphin. 189, 67.
HAB. Brazil, New Friburg.
complicata! *Progomphus complicata* SELYS! Gomphin. 198, 68.
HAB. Brazil, Bahia.
costalis! *Progomphus costalis* HAGEN! Gomph. 200, 69.
HAB. Brazil.

intricata! *Progomphus intricatus* Hagen! Gomphin. 421, 68, bis.
Hab. Amazon.
infumata! *Diastatomma infumatum* Ramb.! Neuropt. , 4. *Gomphoides infumata* Selys! Gomphin. 210, 73.
Hab. Brazil.
fuliginosa! *Gomphoides fuliginosa* Hagen! Gomphin. 211, 74.
Hab. British Guiana, Essequibo.
audax! *Gomphoides audax* Hagen! Gomphin. 213, 75.
Hab. Brazil.
diphylla! *Cyclophylla diphylla* Selys! Gomphin. 217, 77.
Hab. Brazil.
gladiata! *Cyclophylla gladiata* Hagen! Gomphin. 219, 78.
Hab. Brazil, Pernambuco.
signata! *Cyclophylla signata* Hagen! Gomphin. 220, 79.
Hab. Brazil, Venezuela.
sordida! *Cyclophylla sordida* Selys! Gomphin. 223, 80.
Hab. Para.
brevipes! *Aphylla brevipes* Selys! Gomphin. 227, 82.
Hab. Para.
producta! (See North American Neuropt.)
Hab. British Guiana; Surinam; Brazil, Bahia.
dentata! *Aphylla dentata* Selys! addit. Synops. 21, 81, bis.
Hab. Amazon (Bates).
campanulata! *Diastatomma campanulata* Burm.! Hdb. II, , 4. *Conophora campanulata* Selys! Gomphin. 234, 84.
Hab. Brazil.
angustipennis! *Diaphlebia angustipennis* Selys! Gomphin. 237, 85.
Hab. Amazon, Para.
brevistylus! (See North American Neuropt.)
Hab. Colombia.

Ictinus Rambur.

latro! *Ictinus latro* Erichs.! Schomburgk, Reise Guiana, III. Selys! Gomphin. 294, 102.
Hab. British Guiana.

Cordulegaster Leach.

diastatops! *Thecaphora diastatops* Selys! Gomphin. 320, 105.
Hab. Colombia.

Petalia Hagen.

punctata! *Petalia punctata* Hagen! Gomphin. 353, 117.
Hab. Chili, Ouchacay.
stictica! *Phyllopetalia stictica* Hagen! Gomphin. 357, 118.
Hab. Chili, Valdivia.
apicalis! *Phyllopetalia apicalis* Selys! Gomphin. 359, 119.
Hab. Chili, Valdivia.

Phenes Rambur.

raptor! *Phenes raptor* Ramb.! Neuropt. 176, 1. Selys! Gomphin. 377, 123.
Hab. Chili, Valparaiso.

Sub-Fam. IV. AESCHNINA.

Anax Leach.

amazili! (See North American Neuropt.)
Hab. Venezuela, Brazil, Pernambuco.

Aeschna Fabricius.

variegata. *Aeschna variegata* Fabr. Entom. Syst. II, 384, 2.
Hab. Terra del Fuego (Banks).
costalis! *Aeschna costalis* Burm.! Hdb. II, 837, 3. *Gynacantha ferox* Erichs.! Schomburgk. Guiana, III.
Hab. Guiana; Bahia.
luteipennis! *Aeschna luteipennis* Burm.! Hdb. II, 837, 4.
Hab. Brazil; St. Leopoldo.
reticulata! *Aeschna reticulata* Burm.! Hdb. II, 837, 5.
Hab. Brazil; Venezuela.
virens! *Aeschna virens* Rbr.! Neuropt. 193, 3. (See North American Neuroptera.)
Hab. St. Cruz de Bolivia; Venezuela.
marchali. *Aeschna marchali* Ramb. Neuropt. 203, 14.
Hab. Columbia.
diffinis! *Aeschna diffinis* Rbr. Neuropt. 203, 15.
Hab. Chili.
bonariensis! *Aeschna Bonariensis* Rbr. Neuropt. 204, 16.
Hab. Buenos Ayres; St. Leopoldo.
confusa. *Aeschna confusa* Ramb. Neuropt. 205, 17.
Hab. Buenos Ayres.
angusta! *Aeschna angusta* Hagen!
Hab. Brazil.(?)
jucunda! *Aeschna jucunda* Hagen!
Hab. Montevideo, New Friburg; Venezuela.
prasina! *Aeschna prasina* Hagen!
Hab. Pernambuco.
configurata! *Aeschna configurata* Hagen!
Hab. Valparaiso.
depravata! *Aeschna depravata* Hagen!
Hab. Brazil; New Friburg.
lobata! *Aeschna lobata* Hagen!
Hab. Brazil. New Friburg.
brevifrons! (See North American Neuropt.)
Hab. Valparaiso.
rufina! *Aeschna rufina* Hagen!
Hab. Brazil, Minas Geraës.

faunaria! *Aeschna faunaria* HAGEN!
HAB. Brazil, Rio.

Gynacantha Rambur.

gracilis! *Aeschna gracilis* BURM.! Hdb. II, 837. 6. *Gynacantha nervosa* RAMB. Neuropt. 213, 7.
HAB. Brazil, St. Cruz de Bolivia, Surinam, Pernambuco, Rio.
trifida! (See North American Neuropt.)
HAB. Brazil.
septima. (See North American Neuropt.)
HAB. Brazil.
lanceolata! *Gynacantha lanceolata* HAGEN.
HAB. Pernambuco.
elata! *Gynacantha elata* HAGEN!
HAB. Brazil, New Friburg.
obscuripennis! *Aeschna obscuripennis* BLANCHARD, Voyag. d'Orbigny.
HAB. Bolivia; Venezuela.
tenuis! *Gynacantha tenuis* HAGEN!
HAB. Brazil.
conica! *Gynacantha conica* HAGEN!
HAB. Venezuela, Surinam.

Tribe III. **LIBELLULINA.**

Sub-Fam. V. CORDULINA.

Cordulia Leach.

valga! *Cordulia valga* HAGEN!
HAB. Brazil, New Friburg.
forcipula! *Cordulia forcipula* HAGEN!
HAB. Brazil, Mus. Berlin.
rustica! *Cordulia rustica* HAGEN!
HAB. Brazil, Mus. Berlin.
setifera! *Cordulia setifera* HAGEN!
HAB. Brazil, Mus. Berol.
chilensis! *Cordulia chilensis* HAGEN!
HAB. Chili; Brazil, Salto Grande.
tomentosa. *Libellula tomentosa* FABR. Entom. Syst. II, 381, 34.
HAB. America.
villosa. *Cordulia villosa* RBR. Neuropt. 144, 1.
HAB. Chili.

Sub-Fam. VI. LIBELLULINA.

Pantala Hagen.

flavescens! (See North American Neuropt.)
HAB. Venezuela; Surinam; Brazil.

Tramea Hagen.

basalis! *Libellula basalis* Burm. Hdb. II, 852, 25.
Hab. Brazil.

binotata! *Libellula binotata* Rbr.! Neuropt. 36, 7.
Hab. Brazil, Minas Geraës.

cophysa! *Libellula cophysa* Kollar.
Hab. Brazil.

marcella! *Libellula marcella* Selys.
Hab. Brazil.

argo! *Tramea argo* Hagen!
Hab. Rio, Brazil.

Libellula Linné.

appendiculata! *Libellula appendiculata* Selys!
Hab. Merida, Venezuela.

umbrata! (See North American Neuropt.)
Hab. Venezuela, Porto Cabello; Guiana; Surinam; Essequibo; Brazil, Bahia, Rio; Buenos Ayres. Everywhere common.

cyanea. *Libellula cyanea* Fabr. Entom. Syst. II, 381, 36.
Hab. America.
It is a species unknown to me; perhaps *L. quadrupla?*, but the "abdomen" is said to be "cylindrical."

Sub-gen. *Orthemis* Hagen.

discolor! (See North American Neuropt.)
Hab. Venezuela, Porto Cabello; Guiana; Surinam; Chili; Ecuador, Guayaquil; Brazil, Bahia, Pernambuco, Minas Geraës, Rio. Extremely common.

Lepthemis Hagen.

vesiculosa! (See North American Neuropt.)
Hab. Guiana; Brazil, Pernambuco, Bahia, Rio.

haematogastra! (See North American Neuropt.)
Hab. Surinam; Brazil, Pernambuco.

verbenata! (See North American Neuropt.)
Hab. Venezuela, Porto Cabello; Surinam; Brazil.

picta! *Lepthemis picta* Hagen!
Hab. Brazil.

cardinalis! *Libellula cardinalis* Ericus.! Schomburgk, Voyag. Guiana, III, 583.
Hab. Guiana, Essequibo.

attenuata! *Libellula attenuata* Ericus.! Schomburgk, Voyag. Guiana, III, 583.
Hab. Guiana; Brazil.

extensa! *Lepthemis extensa* Hagen!
Hab. Brazil, Pernambuco.

cultriformis! *Lepthemis cultriformis* Hagen!
Hab. Brazil.

Dythemis Hagen.

pleurosticta! (See North American Neuroptera.)
HAB. Brazil.

tenuis! *Dythemis tenuis* HAGEN!
HAB. Brazil, New Friburg.

infamis! *Dythemis infamis* HAGEN!
HAB. Brazil, Pernambuco.

marmorata! *Dythemis marmorata* HAGEN!
HAB. Brazil, New Friburg.

hemichlora! *Libellula hemichlora* BURM.! Hdb. II, 849, 4.
HAB. Venezuela, Porto Cabello; Brazil, Bahia.

tessellata! *Libellula tessellata* BURM.! Hdb. II, 849, 5.
HAB. Brazil.

sterilis! *Dythemis sterilis* HAGEN! *Libellula tessellata* RAMB.! Neuropt. 89, 82.
HAB. Venezuela; Brazil, Pernambuco, Rio; Surinam; Lima; Buenos Ayres.

lepida! *Dythemis lepida* HAGEN!
HAB. Brazil, New Friburg.

gerula! *Dythemis gerula* HAGEN!
HAB. Brazil, New Friburg.

liriope! *Dythemis liriope* HAGEN!
HAB. Brazil.

apicalis! *Dythemis apicalis* HAGEN!
HAB. Brazil, Rio; Surinam.

cydippe! *Dythemis cydippe* HAGEN!
HAB. Brazil, Rio.

typographa! *Dythemis typographa!*
HAB. Chili.

icterica! *Dythemis icterica* HAGEN!
HAB. Brazil, Surinam.

phryne. *Libellula phryne* PERTY, Delectus Anim. 125; tab. XXV, fig. 3.
HAB. Brazil, Piauhy.

columba! *Dythemis columba* HAGEN!
HAB. Venezuela.

tabida! *Dythemis tabida* HAGEN!
HAB. Brazil.

musiva! *Dythemis musiva* HAGEN!
HAB. Brazil, Rio, Minas Geraës.

catenata! *Dythemis catenata* HAGEN!
HAB. Brazil, Minas Geraës.

rapax! *Dythemis rapax* HAGEN.
HAB. Venezuela.

nubecula! *Dythemis nubecula* RER.! Neuropt. 122, 129.
HAB. Brazil, New Friburg.

Erythemis Hagen.

furcata! (See North American Neuroptera.)
HAB. Brazil, Bahia.

longipes! (See North American Neuroptera.)
HAB. Brazil, Rio, Minas Geraës.

bicolor! (See North American Neuroptera.)
HAB. Surinam; Guiana; Brazil.

peruviana. *Libellula peruviana* RBR. Neuropt. 81, 69.
HAB. Peru. (Perhaps *E. bicolor.*)

lavata! *Erythemis lavata* HAGEN!
HAB. Venezuela.

rubriventris! *Libellula rubriventris* BLANCHARD, Voyag. d'Orbigny.
HAB. Corrientes. (Is it of this genus?)

Mesothemis Hagen.

gilva! *Mesothemis gilva* HAGEN!
HAB. Venezuela.

annulata! *Libellula annulata* PALIS. DE BEAUV. Ins. Neur. 58, tab. iii, fig. 3. RAMBUR! Neuropt. 78, 65 (partly).
HAB. Brazil.

plebeja! *Libellula plebeja* RAMB. Neuropt. 107, 106.
HAB. Chili; Guillota.

connata! *Libellula connata* BURM.! Hbd. II, 855, 44.
HAB. Valparaiso; Guillota.

communis. *Libellula communis* RBR. Neuropt. 93, 88.
HAB. Chili. (Is it of this genus?)

distinguenda. *Libellula distinguenda* RAMB. Neuropt. 81, 68. *Libellula incompta* RAMB. Neuropt. 119, 124 (fem.).
HAB. Cayenne.

abbreviata. *Libellula abbreviata* RAMB. Neuropt. 119, 123.
HAB. Cayenne. (Is it of this genus?)

Diplax Charpentier.

ochracea! (See North American Neuroptera.)
HAB. Veneznela, Porto Cabello; Guiana; Surinam; Brazil; Bahia.

minuscula! (See North American Neuroptera.)
HAB. Brazil.

credula! (See North American Neuroptera.)
HAB. Brazil, Minas Geraës.

abjecta! (See North American Neuroptera.)
HAB. Venezuela, Brazil.

obesa! *Diplax obesa* HAGEN!
HAB. Brazil.

unimaculata! *Libellula unimaculata* DE GEER, Mém. III, 558, 4, tab. xxvi, fig. 5. BURM. Hdb. II, 855, 43.
HAB. Surinam, Guiana; Brazil, Pernambuco.

famula! *Libellula famula* ERICHS.! Schomburgk, Voyag. Guian. III, 584.
HAB. Guiana.

fuscofasciata. *Libellula fuscofasciata* BLANCHARD, Voyag. d'Orbigny.
HAB. Corrientes. (Is it of this genus?)

fusca! *Libellula fusca* RBR.! Neuropt. 78, 64.
HAB. Cayenne; Brazil.

apollina! *Libellula apollina* De Selys!
Hab. Brazil.
catharina! *Libellula catharina* De Selys!
Hab. Brazil.
indigna! *Diplax indigna* Hagen!
Hab. Brazil.
juliana! *Libellula juliana* De Selys!
Hab. Brazil.
postica! *Diplax postica* Hagen!
Hab. Brazil.
fausta! *Libellula fausta* De Selys!
Hab. Brazil.
faustina! *Libellula faustina* De Selys.
Hab. Brazil.
contusa! *Libellula contusa* Hagen!
Hab. Brazil.
latimacula! *Libellula latimacula* De Selys!
Hab. Brazil.
sobrina. *Libellula sobrina* Rbr.! Neuropt. 114, 116.
Hab. Brazil.
effrenata! *Libellula effrenata* Hagen!
Hab. Brazil.
familiaris! *Diplax familiaris* Hagen!
Hab. Brazil.
agricola! *Diplax agricola* Hagen!
Hab. Brazil.
luciana! *Libellula luciana* De Selys!
Hab. Brazil.
flavilatera! *Diplax flavilatera* Hagen!
Hab. Brazil.
bilineata! *Libellula bilineata* Hagen!
Hab. Brazil, New Friburg.
venosa! *Libellula venosa* Burm.! Hdb. II, 848, 1.
Hab. Brazil, Bahia.
oscularis! *Diplax oscularis* Hagen!
Hab. Brazil.
cyanifrons! *Libellula cyanifrons* Hagen!
Hab. Brazil.
pulla! *Libellula pulla* Burm.! Hdb. II, 855, 41.
Hab. Surinam.
nigricans! *Libellula nigricans* Ramb. Neuropt. 97, 95.
Hab. Buenos Ayres.
vilis. *Libellula vilis* Rbr. Neuropt. 98, 96.
Hab. Buenos Ayres.

Perithemis Hagen.

domitia! (See North American Neuropt.)
Hab. Venezuela; Brazil, Bahia, St. Leopoldo.
lais! *Libellula lais* Perty, Delect. Anim. 125, tab. xxv.
Hab. Brazil, Pernambuco.

thais! *Perithemis thais* Hagen!
Hab. Amazon River.
cloe! *Perithemis cloë* Hagen!
Hab. Brazil.
bella! *Perithemis bella* Hagen!
Hab. Para.

Nannophya Rambur.

semiaurea! *Libellula semiaurea* Berlin Museum.
Hab. Para.
prodita! *Libellula prodita* Hagen.
Hab. Brazil, Pernambuco.

Uracis Rambur.

imbuta! *Libellula imbuta* Burm.! Hdb. II, 850, 9. *Uracis quadra* Rbr.! Neuropt. 31, tab. ii. fig. 5.
Hab. Surinam; Brazil, Bahia.
fastigiata! *Libellula fastigiata* Burm.! Hdb. II, 850, 10.
Hab. Bahia.
irrorata! *Uracis irrorata* Hagen!
Hab. Bahia.
ovata! *Uracis ovata* Hagen!
Hab. Bahia.

Sub-gen. (new).

guttata! *Libellula guttata* Erichs.! Schomburgk, Voyag. Guiana, III, 584.
Hab. Guiana.
infumata! *Libellula infumata* Rbr. Neuropt. 74, 59.
Hab. Brazil.
amphithea! *Libellula amphithea* De Selys.
Hab. Brazil.
clymene! *Libellula clymene* Hagen!
Hab. Brazil, Pernambuco.

Palpopleura Rambur.

fasciata! *Libellula fasciata* Linné, Syst. Nat. II, 903, 12. Fabr. Entom. Syst. II, 378, 20. Burm. Hdb. II, 854, 37. Rambur, Neuropt. 134, 8 (partly).
Hab. Brazil; Surinam.
americana! *Libellula americana* Linné, Syst. Nat. II, 904, 16. Fabr. Entom. Syst. II, 378, 20. Degeer, Mém. III, 559, 7; tab. xxvi, fig. 7. Seba, Thesaur. tab. lxxviii, fig. 11—12.
Hab. Brazil.
circumcincta! *Palpopleura circumcincta* Hagen!
Hab. Brazil.

Diastatops Rambur.

dimidiata! *Libellula dimidiata* Linné, Syst. Nat. II, 908, 14. Degeer, Mémoir. III, 558; tab. xxvi, fig. 6. Burm. Hdb. II, 854, 36. Rambur, Neuropt. 129, 1. Erichs. Voy. Schomburgk, III, 584.
Hab. Surinam; Essequibo, Guiana.

tincta! *Diastatops tincta* Ramb. Neuropt. 135, 1. Erichs. Voy. Schomburgk, III, 584.
Hab. Brazil; St. Louis de Maranhon; Guiana.

pullata! *Libellula pullata* Burm.! Hdb. II, 854, 34. Ramb. Neuropt. 136, 2; tab. iii, fig. 4.
Hab. Brazil; Pernambuco; Peru; Moxos.

obscura! *Libellula obscura* Fabr. Entom. Syst. 377, 15. Burm.! Hdb. II, 584, 35. Ramb. Neuropt. 137, 3.
Hab. Brazil.

Fam. VII. SIALINA.

Chauliodes Latreille.

chilensis! *Chauliodes chilensis* Hagen, Collect.
Hab. Valparaiso, Valdivia.

Corydalis Latreille.

armata! *Corydalis armatus* Hagen. *Corydalis cornuta* Ramb.! Neuropt. 440, 1. Walk.! Catal. Br. Mus. 208, 1.
Hab. Columbia, Venezuela.

affinis! *Corydalis affinis* Burm.! Hdb. II, 951, 2. *Corydalis cephalotes* Ramb.! Neuropt. 441, 2. Walk. Catal. Br. Mus. 208, 2.
Hab. Brazil, New Friburg.

armigera! *Corydalis armigera* Hagen, Collect.
Hab. Brazil.

vetula! *Corydalis vetula* Hagen, Collect.
Hab. Brazil.

ancilla! *Corydalis ancilla* Hagen, Collect.
Hab. Paraguay.

nubila! *Corydalis nubila* Erichs.! Schomburgk, Reise Guiana, III.
Hab. British Guiana; Venezuela.

hieroglyphica! *Neuromus hieroglyphicus* Rbr.! Neuropt. 442, 2. Walk. Catal. Br. Mus. 206, 12.
Hab. Cayenne; Venezuela; Brazil; Buenos Ayres.

livida! *Corydalis livida* Hagen, Collect.
Hab. Brazil.

illota! *Corydalis illota* Hagen, Collect.
Hab. Brazil.

(**Raphidia** Linné.)

R. varia Walker and the species described by Dr. Fischer, belong to *Mantispa*.

Fam. VIII. HEMEROBINA.

Hemerobius Linné.

lentus! *Hemerobius lentus* Hagen, Collect.
Hab. Brazil.

signatus! *Hemerobius signatus* Hagen, Collect.
Hab. Chili.

Mantispa Illiger.

semihyalina! *Mantispa semihyalina* Serville, Encycl. Meth. X, 270. Ramb. Neuropt. 434, 7; pl. x, fig. 5. Westwood, Trans. Ent. Soc. Lond. ser. 2, I, 253, 1. Walk.! Catal. Br. Mus. 214, 1. *Mantispa chalybea* Erichs.! Germar Zeitschr. I, 160, 1. *Mantispa grandis* Burm. Hdb. II, 967, 4.
Hab. Brazil, Surinam.

ambusta. *Mantispa ambusta* Erichs. Germar Zeitschr. I, 162, 4. Westwood, Trans. Ent. Soc. Lond. ser. 2, I, 254, 4. Walk. Catal. Br. Mus. 215, 4.
Hab. Montevideo.

irrorata! *Mantispa irrorata* Erichs.! Germar Zeitschr. I, 162, 5. Westwood, Trans. Ent. Soc. Lond. ser. 2, I, 254, 5. Walk. Catal. Br. Mus. 215, 5. *Raphidia riedeliana* Fischer, Bullet. Moscow, VII, 329; tab. vii, fig. 1.
Hab. Brazil.

decorata! *Mantispa decorata* Erichs.! Germar Zeitschr. I, 163, 6; pl. 2, fig. 5. Westwood, Trans. Ent. Soc. Lond. ser. 2, I, 254, 6. Walk. Catal. Br. Mus. 215, 6.
Hab. Brazil.

prolixa! *Mantispa prolixa* Erichs.! Germar Zeitschr. I, 163, 7. Westwood, Trans. Ent. Soc. Lond. ser. 2, I, 254, 6.
Hab. Brazil.

costalis. *Mantispa costalis* Erichs. Germar Zeitschr. I, 164, 9. Westwood, Trans. Ent. Soc. Lond. ser. 2, I, 254, 9. Walk. Catal. Br. Mus. 216, 9.
Hab. Brazil.

flaveola! *Mantispa flaveola* Erichs. Germar Zeitschr. I, 168, 13. Westwood, Trans. Ent. Soc. Lond. ser. 2, I, 254, 13. Walk. Catal. Br. Mus. 216, 13.
Hab. Para.

gracilis! *Mantispa gracilis* Erichs.! Germar Zeitschr. I, 169, 18. Westwood, Trans. Ent. Soc. Lond. ser. 2, I, 255, 18. Walk. Catal. Br. Mus. 219, 18.
Hab. Brazil, Pernambuco.

viridula! *Mantispa viridula* Erichs.! Germar Zeitschr. I, 170, 19. Westwood, Trans. Ent. Soc. Lond. ser. 2, I, 255, 19. Walk. Catal. Br. Mus. 219, 19. *Raphidia margaritacea* Fischer? Bullet. Moscow, VII, 330; tab. vii, fig. 1.
Hab. Brazil.

flavomaculata. *Mantispa flavomaculata* Latr. Gen. Crust. III, 94. Erichs. Germar Zeitschr. 173, 24. Westwood, Trans. Ent. Soc. Lond. ser. 2, 255, 28. Walk. Catal. Br. Mus. 220, 23. *Mantispa liliputana* Oliv. Encycl. Meth. VII, 640, 3. Stoll, Spectr. VII, pl. ii, fig. 7.
Hab. Surinam.

iridipennis. *Mantispa iridipennis* Guérin, Icon. Regn. Anim. Ins. 392. *Mantispa gracilis* Ramb. Neur. 433, 6? Westwood, Trans. Ent. Soc. Lond. ser. 2, I, 256, 30. Walk. Catal. Br. Mus. 222, 30.
Hab. Columbia.

areolaris. *Mantispa areolaris* Westwood! Trans. Ent. Soc. Lond. ser. 2, I, 265, 41; pl. xviii, fig. 3. Walk. Catal. Br. Mus. 226, 41.
Hab. Brazil.

chilensis! *Mantispa chilensis* Hagen! Stett. Ent. Zeit. 1859, 708, 8.
Hab. Chili.

Trichoscelis Westwood.

notha! *Mantispa notha* Burm.! Hdb. II, 968, 5. Erichs.! Germ. Zeitschr. I, 170, 20; pl. ii, fig. 6. Westwood, Trans. Ent. Soc. Lond. ser. 2. I, 255, 20. Walk. Catal. Br. Mus. 219, 20.
Hab. Brazil.

fenella. *Mantispa fenella* Westwood! Trans. Ent. Soc. Lond. ser. 2, I, 269, 46; pl. xviii, fig. 7. Walk. Catal. Br. Mus. 227, 46.
Hab. Para.

varia. *Raphidia varia* Walk.! Catal. Br. Mus. 212, 13.
Hab. Brazil.

Chrysopa Leach.

divisa! *Chrysopa divisa* Walk.! Catal. Br. Mus. 242, 12.
Hab. Brazil.

hybrida! *Chrysopa hybrida* Schneid. Chrys. 81, 10, pl. xvi. Ramb. Neuropt. 426, 7. Walk. Catal. Br. Mus. 245, 20.
Hab. Brazil.

brasiliensis. *Chrysopa brasiliensis* Schneid. Chrys. 83, 11, pl. xvii. Walk. Catal. Br. Mus. 246, 21.
Hab. Brazil.

cincta. *Chrysopa cincta* Schneid. Chrys. 86, 13, pl. xix. Walk. Catal. Br. Mus. 247, 24.
Hab. Brazil, Para.

circumfusa! *Chrysopa circumfusa* Schneid.! Chrys. 87, 14, pl. xx. Burm. Hdb. II, 980, 3. Walk. Catal. Br. Mus. 247, 25.
Hab. Brazil.

cruentata! *Chrysopa cruentata* Schneid.! Chrys. 89, 15, pl. xxi. Walk. Catal. Br. Mus. 248, 26.
Hab. Brazil.

costalis! *Chrysopa costalis* Schneid.! Chrys. 90, 16, pl. xxii. Walk. Catal. Br. Mus. 248, 27.
Hab. America.

intermedia! *Chrysopa intermedia* Schneid. Chrys. 106, 27, pl. xxxiii. Walk. Catal. Br. Mus. 252, 40.
Hab. Brazil.

internata! *Chrysopa internata* Walk.! Catal. Br. Mus. 252, 41.
Hab. Brazil.

nigrovaria. *Chrysopa nigrovaria* Walk. Catal. Br. Mus. 253, 42.
Hab. Venezuela.

elegans! *Hemerobius elegans* Guér. Icon. Règn. Anim. 388. Schneid.! Chrys. 134, 42, pl. xlii. Walk. Catal. Br. Mus. 261, 59.
Hab. Brazil.

varia. *Chrysopa varia* Schneid. Chrys. 154, 52; pl. 1, viii. Walk. Catal. Br. Mus. 268, 71.
Hab. Brazil, Para.

longicornis. *Hemerobius longicornis* Gray, Griff. Anim. Kingd. XV, 331; pl. lxxii, fig. 3. Schneid. Chrys. 156, 53; pl. lix. Walk. Catal. Br. Mus. 270, 75.
Hab. Brazil.

iridea. *Hemerobius irideus* Oliv. Encyc. Meth. VII, 50, 4. Schneid. Chrys. 161. Walk. Catal. Br. Mus. 274, 84.
Hab. Surinam.

conformis. *Hemerobius conformis* Ramb. Neuropt. 426, 8. Schneid. Chrys. 163. Walk. Catal. Br. Mus. 275, 88.
Hab. Colombia.

valida! *Hemerobius validus* Erichs.! Schomburgk, Reise Guiana, 586. Schneid. Chrysop. 164. Walk. Catal. Br. Mus. 275, 89.
Hab. British Guiana; Brazil, Pernambuco.

ternata! *Chrysopa ternata* Hagen, Collect.
Hab. Pernambuco.

marionella! *Hemerobius marionella* Guér. Revue. Walk.! Catal. Br. Mus. 271, 78.
Hab. Para.

Schneider, Mongr. Chrysop. p. 69, affirms that *Chr. vulgaris*, a very abundant European species, is found in Brazil. I have never seen an American specimen.

Belonoptera Gerstaecker.

spec. nov.
Hab. Cassapava, Brazil. (Mus. Berlin.)

Acanthaclisis Rambur.

striata! *Acanthaclisis striata* Hagen.
Hab. Colombia (Saussure).

fallax! (See North American Neuropt.)
Hab. Colombia; Guiana; Brazil.

Myrmeleon Linné.

immitis. *Myrmeleon immitis* Walk. Catal. Br. Mus. 331, 50.
Hab. Brazil, Santarem.

anomalus. *Myrmeleon anomalus* Ramb. Neuropt. 388, 6. Walk. Catal. Br. Mus. 333, 54.
Hab. Colombia.

ingeniosus. *Myrmeleon ingeniosus* Walk. Catal. Br. Mus. 337, 63.
Hab. Brazil.

cautus. *Myrmeleon cautus* Walk. Catal. Br. Mus. 349, 79.
Hab. Brazil.

dolosus. *Myrmeleon dolosus* Walk. Catal. Br. Mus. 383, 144.
Hab. Brazil, Santarem.

metuendus. *Myrmeleon metuendus* Walk. Catal. Br. Mus. 387, 149.
Hab. Venezuela.

efferus. *Myrmeleon efferus* Walk. Catal. Br. Mus. 387, 150.
Hab. Para.

praedator. *Myrmeleon praedator* Walk. Catal. Br. Mus. 391, 156.
Hab. Brazil, Santarem.

elegans. *Myrmeleon elegans* Perty, Delect. 125; pl. xxv. Ramb. Neuropt. 409, 43. Walk. Catal. Br. Mus. 395, 163.
Hab. Brazil.

subdolus! *Myrmeleon subdolus* Walk.! Catal. Br. Mus. 395, 164.
Hab. Lima.

sticticus. *Myrmeleon sticticum* Blanch. Orbigny Voy. 218, 753; pl. xxviii, fig. 17. Walk. Catal. Br. Mus. 404, 187.
Hab. Chiquibos, Bolivia.

tarsalis. *Formicaleo tarsalis* Guilding, Trans. Linn. Soc. Lond. XVI, 51, 2. Walk. Catal. Br. Mus. 410, 215.
Hab. Demerara?

chilensis! *Myrmeleon chilensis* Hagen, Collect.
Hab. Chili.

corax! *Myrmeleon corax* Hagen, Collect.
Hab. Venezuela.

impar! *Myrmeleon impar* Hagen, Collect.
Hab. Chili.

ornatus! *Myrmeleon ornatus* Klug! Hagen, Collect.
Hab. Brazil.

sericeus! *Myrmeleon sericeus* Hagen!
Hab. Chili.

leprosus! *Myrmeleon leprosus* Hagen!
Hab. Chili.

compensus! *Myrmeleon compensus* Hagen
Hab. Chili.

ereptus! *Myrmeleon ereptus* Hagen!
Hab. Venezuela.

congruus! *Myrmeleon congruus* Hagen
Hab. Amazon River.

arcuatus! *Myrmeleon arcuatus* Hagen.
Hab. Bahia.

sanctus! *Myrmeleon sanctus* Hagen.
Hab. Pernambuco.

mucoreus! *Myrmeleon mucoreus* Hagen.
Hab. Pernambuco.

nervosus! *Myrmeleon nervosus* Hagen!
Hab. Amazon River.

centurio! *Myrmeleon centurio* HAGEN!
HAB. Pernambuco.
infantilis! *Myrmeleon infantilis* HAGEN!
HAB. Columbia.
aequalis! *Myrmeleon aequalis* HAGEN!
HAB. Columbia.

Ascalaphus Fabricius.

* *Eyes sulcated.*

loquax. *Ascalaphus loquax* WALK. Catal. 434, 48.
HAB. Brazil.
subvertens. *Ascalaphus subvertens* WALK. Catal. 437, 55.
HAB. St. Lucia.
inhonestus! *Ascalaphus inhonestus* WALK.! Catal. 437, 56.
HAB. Brazil.
subripiens. *Ascalaphus subripiens* WALK. Catal. 443, 64.
HAB. Venezuela.
impavidus. *Ascalaphus impavidus* WALK. Catal. 443, 65.
HAB. Brazil, Santarem.
intempestivus. *Ascalaphus intempestivus* WALK. Catal. 444, 66.
HAB. Brazil, Santarem.
sepultus. *Ascalaphus sepultus* WALK. Catal. 445, 67.
HAB. Brazil.
nobilis! *Ascalaphus nobilis* HAGEN!
HAB. Columbia.
apicalis! *Ascalaphus apicalis* LEFEB.! (Mus. Berlin.)
HAB. Brazil.
calidus! *Ascalaphus calidus* HAGEN!
HAB. Brazil, Pernambuco.
limbatus! (See North American Neuropt.)
HAB. Brazil.
modestus! *Ascalaphus modestus* HAGEN!
HAB. Venezuela; Surinam; Paramaribo.
chlorops. *Ascalaphus chlorops* BLANCH. Voyag. d'Orbigny, 218, 754; tab. xxviii, fig. 8. WALK. Catal. 453, 81.
HAB. St. Cruz, Bolivia.
cayennensis. *Ascalaphus cayennensis* FABR. Entom. Syst. II, 96, 6.
HAB. Cayenne.
macrocerus! *Ascalaphus macrocerus* BURM.! Hdb. II, 1000, 3.
HAB. Brazil, Bahia.
Perhaps *A. impavidus* WALK.?
versicolor! *Ascalaphus versicolor* BURM.! Hdb. II, 1000, 4. *Ascalaphus appendifer* LEFEBVRE! Mus. Berlin. WALK. Catal. 420, 23. *Calobopterus leptocerus* RBR.! (mas.) Neuropt. 361, 1. WALK. Catal. 440, 59. *Calobopterus nematocerus* RBR.! (fem.) Neuropt. 361, 2. WALK. Catal. 441, 60.
HAB. Brazil.
surinamensis! *Ascalaphus surinamensis* FABR. Entom. Syst. App. 207, 4—5. *Cordulecerus surinamensis* RAMB. Neuropt. 360, tab. ix, fig. 1.

Ascalaphus vulpecula Burm.! Hdb. II, 1001, 6 (mas., wings immaculate). *Ascalaphus garrulus* Walk.! Catal. 441, 61 (mas.). *Ascalaphus alopecinus* Burm.! Hdb. II, 1000, 5 (fem.). *Ascalaphus litigiosus* Walk. Catal. 441, 62.

Hab. Surinam, Brazil, Bahia.

vetula. *Ulula vetula* Ramb. Neuropt. 358, 2. Walk. Catal. 436, 52.

Hab. Brazil, Campos Geraës.

* * *Eyes entire.*

costatus! *Ascalaphus costatus* Burm.! Hdb. II, 1000, 1. *Ascalaphus contrarius* Walk.! Catal. 452, 79. *Ascalaphus imperator* Lefeb.! (Mus. Berlin.)

Hab. Surinam; Brazil, Bahia, Para.

(Perhaps *Byas microcerus* Rbr.?)

subcostatus! *Ascalaphus subcostatus* Burm.! Hdb. II, 1000, 2. *Ascalaphus injurius* Walk.! Catal. 447, 72. *Ascalaphus impediens* Walk.! Catal. 449, 74. *Ascalaphus damnosus* Walk. Catal. 449, 75? *Ascalaphus luteus* Walk.! Catal. 450, 77.

Hab. Brazil, Amazon River, Santarem, Para.

albistigma! *Ascalaphus albistigma* Walk.! Catal. 452, 80. *Ascalaphus circumflexus* Walk.! Catal. 451, 79.

Hab. Venezuela; Brazil, Santarem, Para.

iniquus. *Ascalaphus iniquus* Walk. Catal. 448, 73.

Hab. Brazil.

arenosus. *Ascalaphus arenosus* Walk. Catal. 450, 76.

Hab. Brazil.

appendiculatus. *Ascalaphus appendiculatus* Fabr. Ent. Syst. II, 96, 4. *Haploglenius appendiculatus* Ramb. Neuropt. 363. Walk. Catal. 446, 69.

Hab. Brazil.

Perhaps the male of *A. costatus?*

Fam. IX. PANORPINA.

Bittacus Latr.

brasiliensis! *Bittacus brasiliensis* Klug! Acad. Berol. 1836, 98, 3. Walk. Catal. Br. Mus. 466, 4.

Hab. Brazil, Cassapava.

femoralis. *Bittacus femoralis* Klug! Acad. Berol. 1836, 98, 5. Walk. Catal. Br. Mus. 466, 5.

Hab.

flavescens! *Bittacus flavescens* Klug! Acad. Berol. 1836, 99, 7. Walk. Catal. Br. Mus. 466, 7. *Bittacus affinis* Westw. Trans. Ent. Soc. Lond. IV, 196, 1. Walk. Catal. Br. Mus. 468, 12.

Hab. Brazil, Para.

chilensis. *Bittacus chilensis* Klug! Acad. Berol. 1836, 100, 9; pl. fig. 6. Walk. Catal. Br. Mus. 467, 9.

Hab. Chili.

blancheti! *Bittacus blancheti* Pict. Mém. Genève. VII, 403, fig. 3. Klug! Acad. Berol. 1836, 100, 10. Ramb.! Neuropt. 327, 3; pl. viii. fig. 6. Walk. Catal. Br. Mus. 467, 10.
Hab. Brazil.

Fam. X. PHRYGANINA.

Barypenthus Burmeister.

concolor. *Barypenthus concolor* Burm.! Hdb. II, 929, 2. Walk. Catal. Br. Mus. 54, 1.
Hab. Brazil.

rufipes. *Barypenthus rufipes* Burm.! Hdb. II, 929, 2. Walk. Catal. Br. Mus. 55, 2.
Hab. Brazil.

Sericostoma Latreille.

tropica! *Sericostoma? tropica* Hagen, Collect.
Hab. Brazil.

Macronema Pictet.

hyalinum. *Macronemum hyalinum* Pict. Mém. Genève. VII. Burm. Hdb. II, 916, 3. Walk. Catal. Br. Mus. 75, 3.
Hab. Brazil.

speciosum. *Macronemum speciosum* Burm. Hdb. II, 916, 1. Walk. Catal. Br. Mus. 74, 1.
Hab. Brazil.

lineatum. *Macronema lineata* Pict. Mém. Genève. VII. Burm. Hdb. 916, 2. Walk. Catal. Br. Mus. 74, 2.
Hab. Brazil.

auripenne! *Macronema auripenne* Ramb.! Neuropt. 507, 2. Walk. Catal. Br. Mus. 75, 4.
Hab. Brazil.

rubiginosum. *Macronema rubiginosa* Guèr. Icon. Règn. Anim. Texte, 395. Walk. Catal. Br. Mus. 75, 5.
Hab. Brazil.

oculatum. *Macronema oculata* Walk.! Catal. Br. Mus. 75, 6.
Hab. Venezuela.

cupreum. *Macronema cupreum* Walk.! Catal. Br. Mus. 76, 7.
Hab. Brazil. (Perhaps *M. auripenne?*)

apicale. *Macronema apicalis* Walk.! Catal. Br. Mus. 78, 15.
Hab. Venezuela.

pallida! (See North American Neuropt.)
Hab. Venezuela, Brazil.

vicarium. *Hydropsyche vicaria* Walk.! Catal. Br. Mus. 114, 39.
Hab. Venezuela.

agraphum. *Macronema agraphum* Kolen. Wien. Ent. Zeits. 1859, p. 57.
Hab. Brazil.

arcuatum! *Macronema arcuatum* Erichs.! Schomburgk, Reise Guiana, III.
Hab. British Guiana.

Hydropsyche Pictet.

australis! *Hydropsyche australis* Hagen, Collect.
Hab. Brazil.

Leptocerus Leach.

albicornis. *Mystacides albicornis* Burm. Hdb. II, 918, 1. Walk. Catal. Br. Mus. 69, 54.
Hab. Brazil.

gracilis. *Mystacides gracilis* Burm. Hdb. II, 921, 12. Walk. Catal. Br. Mus. 69, 55.
Hab. Brazil.

princeps. *Mystacides princeps* Burm. Hdb. II, 921, 13. Walk. Catal. Br. Mus. 69, 56.
Hab. Brazil.

maculatus. *Phryganea maculata* Perty, Delect. 129, pl. xxv, fig. 16. Walk. Catal. Br. Mus. 74, 70.
Hab. Brazil, St. Paul.

diaphanus. *Blepharopus diaphanus* Kol. Wien. Ent. Zeit. 1859, p. 58.
Hab. South America.

Chimarrha Leach.

morio! *Chimarrha morio* Burm. Hdb. II, 911, 2. Walk. Catal. Br. Mus. 81, 2.
Hab. Brazil.

maculata! *Chimarrha? maculata* Hagen, Collect.
Hab. Brazil.

LIST OF THE NEUROPTERA DESCRIBED IN THE SYNOPSIS OF NORTH AMERICAN SPECIES.

	GENERA.	Species.	New species.	Species not examined.	United States.	Canada, Greenland, Arct. Amer.	Russian Colonies.	Mexico, Central America.	West Indies.	Species found also in S. Am.	Species found also in Europe.	Species found also in Asia, Africa, or Polynesia.
1	Calotermes	4	..	..	2	..	..	3	3	2	..	1?[2]
2	Termopsis	2	..	..	1	..	..	1	..	..	..	..
3	Termes	11	..	1	1	..	..	5	6	4	1[1]	1?[2]
4	Embia	1	1	..	..	..	..	..	1	..	..	..
5	Clothilla	1	1	..	1	..	..	..	..	..	..	..
6	Atropos	1	..	1	..	1	..	..	..	..	..	..
7	Psocus	16	13	..	15	1	..	2	2	..	..	..
8	Pteronarcys	6	1	1	5	3	..	..	..	..	..	..
9	Perla	40	9	21	25	9	1	9	..	2	..	..
10	Isopteryx	1	..	..	1	..	..	..	..	..	..	..
11	Capnia	4	..	..	2	2	..	..	..	..	..	..
12	Taeniopteryx	5	2	..	4	1	..	..	..	..	..	..
13	Nemoura	3	..	1	2	3	..	..	..	..	..	..
14	Leuctra	2	..	..	1	1	..	..	..	..	..	..
15	Ephemera	5	1	1	3	4	..	..	..	..	..	..
16	Palingenia	8	2	3	3	5	..	2	..	..	..	..
17	Baëtis	19	1	11	11	10	..	1	..	..	..	..
18	Potamanthus	3	..	2	2	2	..	..	..	..	..	..
19	Cloë	7	4	3	5	2	..	1	2	..	1?	..
20	Caenis	3	1	2	3	..	..	..	..	..	..	..
21	Calopteryx	6	..	1	6	1	..	..	..	..	1?	1?[3]
22	Hetaerina	10	..	..	5	..	..	7	1	3	..	..
23	Megaloprepus	1	..	..	..	..	..	1	..	1	..	..
24	Pseudostigma	2	2	..	..	..	..	2	..	1	..	..
25	Mecistogaster	3	1	..	..	..	..	2	1	2	..	..
26	Lestes	13	7	2	9	..	..	3	2	2	..	..
27	Paraphlebia	1	1	1	..	..	..	1	..	..	..	..
28	Palaemnema	1	..	1	..	..	..	1	..	..	..	..
29	Trichocnemis	2	..	2	1	..	..	..	1	..	..	..
30	Protoneura	2	..	2	1	..	..	..	1	..	..	..
31	Nehalennia	2	1	1	1	..	..	..	1	..	..	..
32	Ischnura	18	12	3	11	..	..	5	8	3	..	..
33	Pyrrhosoma	5	3	1	2	..	..	1	2	1	..	..
34	Agrion	23	19	1	14	1	1	9	..	1	..	..
35	Gomphus	19	1	5	19	2	..	..	..	..	..	..
36	Erpetogomphus	6	..	1	2	..	..	4	..	1	..	..
37	Ophiogomphus	1	..	..	..	1	..	..	..	..	..	..
38	Neogomphus	1	..	..	1	..	..	..	..	..	..	..
39	Progomphus	2	..	..	1	..	..	1	..	..	..	..
40	Gomphoides	7	1	2	1	..	..	5	1	1	..	..
41	Hagenius	1	..	..	1	..	..	..	..	1	..	..
42	Cordulegaster	4	..	1	3	..	1	..	..	..	..	..
43	Petalura	1	..	..	1	..	..	..	..	..	..	..
44	Anax	3	..	..	2	..	..	2	1	1	..	1[4]
45	Aeschna	25	13	7	12	4	2	5	5	2	2	2[5]
46	Gynacantha	2	..	1	..	..	..	..	2	2	..	..
47	Macromia	4	2	1	3	..	..	1	..	..	..	..
48	Epitheca	1	1	..	1	..	..	..	..	..	..	..
49	Didymops	2	..	..	2	..	..	..	..	..	..	..
50	Cordulia	15	12	10	5	10	..	..	..	..	..	..
51	Tetragoneuria	4	3	2	3	1	..	..	..	..	..	..
		329	115	92	194	64	5	74	40	30	5	6

[1] (Warmhouse.) [2] Africa. [3] Asia, Africa. [4] Asia et Polynesia. [5] Asia.

List of the Neuroptera of North America—Continued.

	GENERA.	Species.	New species.	Species not examined.	United States	Canada, Greenland, Arct. Amer.	Russian Colonies.	Mexico, Central America.	West Indies.	Species found also in S. Am.	Species found also in Europe.	Species found also in Asia, Africa, or Polynesia.
		329	115	92	194	64	5	74	40	30	5	9
52	Pantala	2	..	..	2	..	..	2	1	1	..	1[1]
53	Tramea	7	3	..	4	..	..	4	4	..	..	1[2]
54	Celithemis	2	1	..	1	..	..	1	1	..	..	..
55	Plathemis	2	1	..	2	..	..	..	..	..	..	..
56	Libellula	22	6	..	18	1	..	6	3	2	1	1[2]
57	Lepthemis	3	1	..	1	..	..	1	2	3	..	..
58	Dythemis	13	9	..	3	..	..	5	8	1	..	..
59	Erythemis	3	2	..	..	..	..	2	2	3	..	..
60	Mesothemis	7	3	2	5	..	..	4	3	..	..	1[2]
61	Diplax	20	6	2	14	3	..	1	4	4	1	1[2]
62	Perithemis	1	..	..	1	..	..	1	1	1	..	..
63	Nannophya	3	2	1	3	..	..	..	..	..	..	..
64	Sialis	3	1	..	2	1	..	..	1	..	..	..
65	Chauliodes	7	1	1	7	..	..	..	..	..	..	..
66	Corydalis	5	3	..	2	1	..	3	..	1	..	..
67	Raphidia	4	4	..	4	..	..	..	..	..	1	..
68	Aleuronia	1	..	1	1	..	..	..	..	..	..	..
69	Coniopteryx	1	1	..	1	..	..	..	..	..	..	..
70	Sisyra	1	..	1	1	..	..	..	..	..	..	..
71	Megalomus	1	1	..	..	..	..	1	..	..	..	..
72	Micromus	5	3	1	5	..	..	..	..	..	..	..
73	Hemerobius	21	2	18	16	4	..	1	..	..	..	..
74	Polystoechotes	2	..	1	2	1	..	..	..	..	..	..
75	Mantispa	4	1	1	4	..	..	1	..	..	..	..
76	Meleoma	2	..	2	2	..	..	..	..	..	..	..
77	Chrysopa	37	4	16	26	3	..	5	6	1	1	1[2]
78	Acanthaclisis	3	1	1	2	..	..	1	1	1	..	..
79	Myrmeleon	25	10	8	19	..	..	4	3	1	..	..
80	Euptilon	1	..	1	1	..	..	..	..	..	..	..
81	Ascalaphus	7	1	1	2	..	..	3	3	1	..	..
82	Boreus	2	..	..	2	..	..	..	..	..	..	..
83	Panorpa	12	1	3	9	2	..	2	..	..	..	..
84	Bittacus	7	2	3	6	1	..	1	..	..	..	..
85	Merope	1	..	..	1	..	..	..	..	..	..	..
86	Neuronia	8	..	4	6	6	..	..	..	..	..	..
87	Phryganea	3	..	2	2	1	..	..	..	..	..	..
88	Limnophilus	30	6	18	10	18	2	..	..	..	5	2[2]
89	Anabolia	4	2	2	2	3	..	..	..	..	..	..
90	Hallesus	7	4	1	4	4	..	1	..	..	..	..
91	Enoicyla	7	2	2	3	5	..	..	..	..	..	..
92	Apatania	2	1	1	..	2	..	..	..	..	..	..
93	Sericostoma	2	..	2	2	..	..	..	..	..	..	..
94	Notidobia	3	2	..	2	1	..	..	1	..	..	..
95	Brachycentrus	2	1	1	1	1	..	..	..	..	..	..
96	Silo	2	2	..	2	..	..	..	..	..	..	..
97	Mormonia	1	1	..	1	1	..	..	..	..	..	..
98	Dasystoma	2	..	2	2	..	..	..	..	..	..	..
99	Hydroptila	3	2	1	..	3	..	..	..	..	..	..
100	Molanna	3	2	1	2	1	..	..	..	..	..	..
101	Leptocerus	13	5	7	7	6	..	..	..	..	1	..
102	Setodes	14	9	2	10	6	..	2	..	..	1	..
103	Macronema	6	4	..	2	1	..	4	1	3	..	..
		678	228	201	420	140	7	130	85	53	16	14

[1] Africa, Asia, Polynesia. [2] Asia.

List of the Neuroptera of North America—Continued.

	GENERA.	Species.	New species.	Species not examined.	United States.	Canada, Greenland, Arct. Amer.	Russian Colonies.	Mexico, Central America.	West Indies.	Species found also in S. Am.	Species found also in Europe.	Species found also in Asia, Africa, or Polynesia.
		678	228	201	420	140	7	130	85	53	16	14
104	Hydropsyche .	16	8	8	12	8	..	..	1	..	..	..
105	Philopotamus .	2	..	2	1	1	..	..	..	..	..	..
106	Polycentropus .	8	4	4	5	3	..	..	..	..	..	..
107	Psychomia . .	2	1	1	1	2	..	..	..	..	..	..
108	Tinodes . . .	2	1	1	..	2	..	..	..	..	..	..
109	Rhyacophila .	2	1	1	1	1	..	..	..	..	..	..
110	Beraea . . .	2	1	1	1	1	..	..	..	..	..	..
111	Chimarrha . .	4	3	1	2	1	..	..	1	..	..	..
	Total . .	716	247	220	443	159	7	130	87	53	16	14

The number of species entirely unknown to me is considerably less than what is mentioned in the column of "species not examined;" this includes many species at one time seen in the British Museum, but which I have not since been able to re-examine.

	FAMILIES.	Genera.	Species.
1	Termitina	3	17
2	Embidina	1	1
3	Psocina	3	18
4	Perlina	7	61
5	Ephemerina	6	45
6	Odonata	43	273
7	Sialina	4	19
8	Hemerobina	14	111
9	Panorpina	4	22
10	Phryganina	26	150
		111	716

DISTRIBUTION OF SPECIES,

(AS FAR AS AT PRESENT KNOWN.)

	Species.		Species.		Species.
Massachusetts .	27	Ohio	21	Alabama . . .	1
Vermont . . .	1	Michigan . .	1	Florida . . .	35
New York . .	104	Indiana . . .	22	Louisiana . .	33
Pennsylvania .	65	Illinois . . .	44	Texas	43
New Jersey . .	25	Missouri . . .	16	California . .	32
Delaware . .	1	Wisconsin . .	5	North America,	
Maryland . .	42	N. W. Territory	9	United States	
Dist. of Columbia	78	Carolina . . .	29	without locality	35
Virginia . . .	24	Tennessee . .	3	Arkansas . .	2
Kentucky . .	9	Georgia . . .	104	Mississippi . .	2
Greenland . .	6	Mexico . . .	112	Martinique . .	8
Arctic America	29	Central America	22	St. Thomas . .	12
Russian Colonies	7	Cuba	61	Guadaloupe . .	3
Canada . . .	100	St. Domingo .	15	Barbadoes . .	1
Labrador . .	6	Porto Rico . .	7	St. Cruz . .	1
Nova Scotia . .	33	Jamaica . . .	12	St. Vincent . .	1
Columbia, Venezuela . . .	30	Guiana, Surinam, Cayenne	13	Brazil	38
				Chili	3
				Peru	1

LIST OF THE NEUROPTERA ENUMERATED IN THE CATALOGUE OF SOUTH AMERICAN SPECIES.

	GENERA.	Species.	New species.	Species not examined.	Species taken also in North America.	Brazil.	Guiana, Cayenne, Surinam.	Columbia, Venezuela.	Peru.	Chili.	Buenos Ayres and southern parts.
1	Calotermes . .	5	..	..	2	5	..	2	..	1	..
2	Hodotermes . .	1	..	..	..	..	..	..	..	1	..
3	Termes . . .	25	..	..	4	23	5	3	..	1	..
4	Olyntha . . .	3	..	3	..	3	..	1	..	..	..
5	Thyrsophorus .	4	..	2	..	4	..	..	..	..	..
6	Psocus . . .	8	7	..	..	8	..	..	..	..	..
7	Perla	19	1	13	2	10	..	7	..	2	..
8	Capnia . . .	2	..	1	..	2	..	..	..	..	..
9	Ephemera . .	1	..	1	..	..	..	1	..	..	..
10	Palingenia . .	8	2	5	..	8	..	..	..	..	..
11	Baëtis. . . .	1	..	1	..	1	..	..	..	..	..
12	Cloë	1	..	..	..	1	..	..	..	..	..
13	Oligoneuria . .	1	..	..	..	1	..	..	..	..	..
14	Lais	6	..	..	..	6	..	..	..	..	..
15	Hetaerina . .	20	..	..	3	14	6	5	..	1	..
16	Heliocharis . .	2	..	..	..	2	..	..	..	..	..
17	Dicterias. . .	2	..	..	..	2	..	..	..	..	..
18	Amphipteryx .	1	..	..	..	..	..	1	..	..	..
19	Calopteryx . .	1	..	..	..	1	..	..	..	..	..
20	Thore. . . .	6	..	..	..	3	1	3	..	..	..
21	Cora	1	..	..	..	..	..	1	..	..	..
22	Megaloprepus .	1	..	..	1	..	..	1	..	..	..
23	Microstigma .	3	2	..	..	3	2	..	1	..	..
24	Pseudostigma .	1	1	..	1	..	..	1	..	..	..
25	Mecistogaster .	5	1	..	2	4	3	2	1	..	..
26	Lestes . . .	8	4	2	2	6	2	2	..	1	1
27	Hyponeura . .	1	1	..	..	..	..	1	..	..	..
28	Euclea . . .	1	1	1	..	1	..	..	..	..	..
29	Podagrion . .	5	5	3	..	3	..	2	..	..	..
30	Leptogaster . .	5	5	3	..	5	..	..	..	..	..
31	Neoneura . .	6	6	3	..	5	..	1	..	..	..
32	Protoneura . .	2	2	1	..	1	..	1	..	..	..
33	Agrion . . .	56	42	20	5	39	2	5	2	4	1
34	Gomphus . .	3	..	..	1	2	..	..	..	1	..
35	Gomphoides .	17	..	..	2	15	2	2	..	..	..
36	Ictinus . . .	1	..	..	..	..	1	..	..	..	..
37	Cordulegaster .	1	..	..	..	..	..	1	..	..	..
38	Petalia . . .	3	..	..	..	..	..	..	..	3	..
39	Phenes . . .	1	..	..	..	..	..	..	..	1	..
40	Anax	1	..	..	1	1	..	1	..	..	..
41	Aeschna . . .	18	9	3	2	11	1	4	2	1	3
42	Gynacantha . .	8	4	1	2	5	1	2	..	..	..
43	Cordulia . . .	7	5	1	..	6	..	..	..	2	..
44	Pantala . . .	1	..	..	1	1	1	1	..	..	..
45	Tramea . . .	5	2	..	..	5	..	..	..	..	..
46	Libellula . .	4	1	1	2	2	2	3	..	1	1
47	Lepthemis . .	8	3	..	3	7	5	1	..	..	..
48	Dythemis . .	21	15	1	1	18	3	4	1	1	..
49	Erythemis . .	6	3	2	3	4	1	1	1	..	..
50	Mesothemis . .	7	1	3	..	1	2	1	..	3	..
51	Diplax . . .	31	19	4	4	26	5	2	..	..	2
		355	144	75	44	265	45	63	8	24	8

List of the Neuroptera of South America—Continued.

	GENERA.	Species.	New species.	Species not examined.	Species taken also in North America.	Brazil.	Guiana, Cayenne, Surinam.	Columbia, Venezuela.	Peru.	Chili.	Buenos Ayres and southern parts.
		355	144	75	44	265	45	63	8	24	8
52	Perithemis . .	5	3	..	1	5	..	1	..	..	..
53	Nannophya . .	2	2	..	..	2	..	..	..	..	..
54	Uracis . . .	8	4	..	..	7	2	..	..	..	..
55	Palpopleura .	3	1	..	..	3	1	..	..	..	..
56	Diastatops . .	4	..	..	..	3	2	..	1	..	..
57	Chauliodes . .	1	1	..	..	..	..	..	..	1	..
58	Corydalis . .	9	5	..	1	6	2	3	..	..	2
59	Hemerobius . .	2	2	..	..	1	..	..	..	1	..
60	Mantispa . .	13	..	5	..	10	1	1	..	1	..
61	Trichoscelis .	3	..	2	..	3	..	..	..	..	..
62	Belonoptera .	1	..	..	..	..	..	..	..	..	..
63	Chrysopa . .	18	1	7	1	15	2	2	..	..	..
64	Acanthaclisis .	2	1	..	1	1	1	2	..	..	..
65	Myrmeleon . .	29	17	11	1	14	1	8	1	5	..
66	Ascalaphus . .	24	4	12	1	19	4	4	..	..	..
67	Bittacus . . .	5	..	2	..	4	..	..	..	1	..
68	Barypenthus .	2	..	2	..	2	..	..	..	..	..
69	Sericostoma . .	1	1	..	..	1	..	..	..	..	..
70	Macronema . .	12	..	9	3	8	1	4	..	..	..
71	Hydropsyche .	1	1	..	..	1	..	..	..	..	..
72	Leptocerus . .	5	..	5	..	5	..	..	..	..	..
73	Chimarrha . .	2	1	..	..	2	..	..	..	..	..
		507	188	128	53	377	62	88	10	33	10

	FAMILIES.	Genera.	Species.
1	Termitina	3	31
2	Embidina	1	3
3	Psocina	2	12
4	Perlina	2	21
5	Ephemerina	5	12
6	Odonata	43	298
7	Sialina	2	10
8	Hemerobina	8	92
9	Panorpina	1	5
10	Phryganina	6	23
		73	507

SUMMARY.

North America contains	716	species.
South America contains	507	"
Total	1223	"

Deducting 53 species found in both North and South America, the whole continent of America contains 1170 species; of which 436 are new to science.

The actual number of "species not examined," 220 for North America and 128 for South America (total 348), is considerably less in reality; the species entirely unknown to me are 83 for North America and 29 for South America (total 112), mostly described by Say, Asa Fitch, and Pictet.

GLOSSARY.[1]

Abnormal. Deviating from the usual type.

Accessory subcostal vein. The vein given off from the *subcosta*, and branching towards the apex of the wing.

Acuminate. Furnished with a produced point.

Adult. The fully matured state of an insect.

Anal angle. The posterior interior corner of a wing.

Anal space. The area at the posterior base of the hind wings, which folds together when the wings are at rest, as in most *Phryganeæ*, &c.

Anastomosis. The thickened point of juncture of nervules.

Angulose. Constituting an angle or angles.

Annulated. Ringed; furnished with ring-like bands.

Annulus. A ring; a narrow, encircling band.

Antecubital. Pertaining to the space between the base of the wing and the *nodus*.

Antehumeral. Pertaining to the space immediately before the origin of the wings.

Antennæ. Two articulated feelers placed superiorly upon the head.

Anteocular. In front of the eyes.

Anterior. Before; forward part.

Anteriorly. Forwardly; in front.

Anus. The vent, or fundament.

Apex. The extremity, or smaller end opposite to the base.

Apical. Pertaining to the apex.

Apical sector. One of the longitudinal veins of the apex of a wing.

Approximated. Placed near; close together.

Arcuated. Curved, as a bow.

Article, or Articulation. A joint; or segment between two transverse sutures.

Areolate. Furnished with small areas.

Auricle. A small ear, or ear-like process.

Auriculated. Furnished with *auricles*.

Basal. Pertaining to the base.

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[1] This Glossary has been prepared by Mr. UHLER, at the request of the Smithsonian Institution, with the view of furnishing an explanation of the technical terms employed in the present work.

Base. The foundation; as, Base of the head: that part of the head applied against the thorax.
Biarcuated. Twice-curved.
Bicolored. Two-colored.
Bidentate. Two-toothed.
Bifid. Two-branched.
Bifurcated. Two-forked.
Bi-impressed. Twice-impressed.
Bilineated. Marked with two lines.
Bilobed. Furnished with two lobes.
Bimaculated. Twice-spotted; having two spots.
Binotated. With two marks, or dots.
Biovate. Twice-ovate.
Biparted. Separated into two parts.
Biserrated. Provided with two small triangular teeth.
Bisetous. Furnished with two bristle-like appendages.
Bituberculated. Provided with two tubercles.
Bivittated. Marked with two longitudinal stripes.
Branchiæ. Breathing tubes analogous to gills.
Calcarated. Armed with spurs.
Carbonaceous. Resembling charcoal.
Carina. An elevated keel-like edge.
Carinate. Furnished with a *carina*.
Carpus. The *pterostigma*.
Caudal. Pertaining to the end of the abdomen.
Cellule. A little space surrounded by veins, on the wings.
Cerci. The superior processes at the end of the abdomen.
Chalybeous. Of a steel-blue color.
Cilia. Hairs set like a fringe; resembling eyelashes.
Ciliated. Furnished with *cilia*.
Cinereous. Of an ash-gray color.
Clavate. Furnished with a thickened extremity like a club.
Clypeus. That part of the head immediately above the *labrum*.
Compressed. Flattened together, as if by pressure applied at each side.
Confluent. Flowing together; united at the ends, as the veins of wings.
Connate. United; not separated by an articulated suture.
Cordiform. Shaped like a heart.
Coriaceous. Of a consistence resembling leather.
Costa. The same as *costal vein*.
Costal. Pertaining to the *costa*.
Costal area. A space between the *costa* and the next longitudinal vein.
Costal vein. The rib-like vein of the anterior margin of the wings, followed, in the section *Neuroptera*, by the *subcosta*, the *radius*, and the *cubitus;* the latter is frequently double (*cub. anticus*, *cub. posticus*).
Cultriform. Shaped like a pruning-knife.
Cuneiform. Shaped like a wedge.

Cupreous. Of a copper-color.
Deciduous. Casting off the wings.
Dentated. Furnished with teeth.
Denticle. A small tooth.
Depressed. Flattened down.
Dilated. Widened, expanded.
Discoidal. Pertaining to the disk or middle.
Discoidal areolets. Spaces of the middle of a wing; in the *Libellulina* they are placed beyond the triangle.
Disk. The middle surface.
Divaricated. Spreading apart, as two gradually separating branches.
Dolabriform. Shaped like a hatchet.
Dorsum. The superior surface of the thorax or abdomen.
Elliptical. Elongate-oval.
Emarginate, or **Emarginated.** Notched.
Ensiform. Sword-shaped; sharp on both edges, and tapering to a point.
Epistoma. That part of the face between the *front* and *labrum.*
Equal. Of the same size or length.
Excision. A cut out of an edge, not always of the same shape.
Facies. Aspect; appearance.
Falcate. Sickle-shaped; curved like a sickle.
Fascia. Used here as a stripe broader than a line.
Femora. The thighs.
Femur. A thigh.
Fenestrated. Marked with transparent spots surrounded by a darker color, somewhat like panes of glass in windows.
Ferruginous. Rust-colored.
Filiform. Slender and cylindrical, like a thread.
Flavescent. Somewhat yellow.
Flexuous. Almost zigzag, more acute at the angles than undulating.
Foliaceous. Leaf-like.
Forcipated. Furnished with two pieces approaching at the ends like pincers.
Fovea. A more or less rounded depression.
Foveolate. Furnished with cavities or depressions.
Free. Unrestrained in articulated movement; not soldered at the points of contact.
Front. The fore-face, bounded by the eyes, the vertex, and usually beneath by the *epistoma.*
Frontal. Pertaining to the *front.*
Fuliginous. Of the color of dark smoke.
Fulvo-aeneous. Brazen, with a tinge of brownish-yellow.
Fulvous. Tawny, color of the common deer.
Furcated. Forked; split into two separating ends.
Fuscescent. Measurably fuscous.
Fusco-ferruginous. Rust-colored, with a brownish tinge.

Fusco-testaceous. Dull reddish-brown.

Fuscous. Dark brown, approaching black.

Fusiform. Spindle-shaped; gradually tapering at each end.

Genital lobe. The bag-like appendage upon the second ventral segment of the male dragon-fly.

Genital accessory organs. The hooks, &c., situated beneath the second ventral segment of the male dragon-fly, &c.

Glaucous. Of a sea-green color.

Guttæ. Marks resembling dots or small spots.

Guttated. Marked with *guttæ*.

Gradate. Step by step; successive.

Granulated. Provided with minute, close prominences, like very small grains of sand, &c.

Hab. Abbreviation of *Habitat*.

Habitat. The place or region which an insect inhabits.

Habitus. Aspect; general appearance, or likeness.

Hamate. Furnished with hooks, or hook-like processes.

Hamule. A small hook.

Hastated. Halberd-shaped; excavated at the base and sides, but with spreading lobes or angles.

Hastiform. Shaped like a halberd.

Haustellate. Furnished with a proboscis-like mouth.

Hirsute. Clothed with shaggy hairs.

Humeral. Belonging to the *humerus* or shoulder.

Hyaline. Transparent; of the color of water.

Imagines. Plural of *imago*.

Imago. The insect in its last stage, after passing through *larva* and *pupa*.

Immarginate. Not furnished with a turned-up edge.

Incanous. Hoary; clothed with whitish hair or powder.

Incision. A slit-like cut.

Incisures. The impressed transverse lines between the segments of the abdomen, &c.

Incomplete. Not fully developed.

Inferiorly. Beneath; pertaining to the lower surface.

Infracted. Bent; suddenly bent.

Infumated. Clouded, as if with tobacco-smoke.

Infuscated. Darkened with a blackish tinge.

Interrupted. Suddenly stopped.

Involuted. Rolled inwards spirally.

Irrorated. Marked with spots like freckles.

Labium. The lower lip of an insect.

Labrum. The upper lip of an insect.

Lamelliform. Shaped like a plate of metal, &c.

Lamina. A plate or sheet-like piece.

Laminated. Provided with *laminæ*.

Lanceolate, or **Lanceolated.** Shaped like a spear.

Larva. The first stage of an insect after it is excluded from the egg.
Lateral. Pertaining to the sides.
Laterally. Sideways.
Linear. Shaped like a line; very narrow in form.
Lineated. Provided with line-like marks.
Lunule. A half-moon-shaped object or mark.
Lurid. Bright colors obscured.
Luteous. Egg-yellow; clay-yellow.
Maculose. Spotted.
Mandibles. Jaws; two, generally horny pieces of the mouth, immediately under the labrum.
Mandibulate. Tarnished with mandibles.
Margined. Edged; provided with a margin.
Marmorated. Marbled; veined like marble.
Maxillæ. Pieces of the mouth which occupy the places of the jaw-bones.
Maxillary palpi. Jointed appendages attached to the *maxillæ*.
Median, or Medial. Of, or occupying the middle.
Median Nervule. The third basal nervule in *Calopterygina*, &c.
Median space. The posterior space at the base of the wings in *Calopteryx*, &c.
Membranaceous. Of a membrane-like character.
Membranule. The small triangular flap at the interior base of the wings in *Libellulina*, &c.
Meridional. Equatorial.
Mesothorax. Middle primary division of the thorax.
Metathorax. The posterior primary division of the thorax.
Mobile. Movable.
Moniliform. Shaped like a string of beads.
Multi-areolate. Composed of many small areas or spaces.
Multi-articulate. Composed of many articles or joints.
Mutic. Unarmed, *i. e.*, without spines, &c.
Nasus. A space directly above the labrum.
Nasute. Bearing a projection like a nose; said of certain workers, &c., amongst the *Termites*.
Nebula. A cloud-like spot.
Nodal. Pertaining to an oblique stout vein, called the *nodus*.
Nodulose. Clothed with knot-like small prominences.
Nodus. A stout, oblique, short vein in the *Odonata*, at the place where the anterior margin of the wings is somewhat drawn in.
Obovate. Inversely ovate, the smaller end turned towards the base.
Obsolete. Not distinct, or almost lost to view.
Obtected. Covered.
Ocelli. The simple eyes of insects; usually three amongst the *Neuroptera*.
Ochraceous, or Ochreous. Of a more or less deep ochre-color.
Occiput. The back part of the head behind the *vertex*.
Olivaceous. Of an olive-color.

Onychium. See *Plantula.*

Oval. Egg-shaped.

Ovate. More or less oval.

Palpi. The feelers attached to the mouth of insects.

Pectus. The breast, or inferior surface of the *thorax.*

Petiolated. Narrowed into a handle-like neck; as the base of the wings in *Agrion.*

Phalerated. Marked with stripes and bands like the harness of a horse.

Piceous. Color of pitch.

Pile. Hair; usually hair arranged somewhat in rows.

Pilose. Clothed with pile.

Plantula. A small lap or membranous appendage between the tarsal nails of insects; also called *Onychium.*

Plicated. Furnished with folds; folded.

Postcostal, or **Postcubital.** Pertaining to the space between the *nodus* and *pterostigma.*

Posteriorly. Behind; after.

Process. A prolongation of the surface, such as an ear-like elevation, &c.

Produced. Drawn out; prolonged.

Prothorax. The first segment of the *thorax.*

Pruinose. Clothed with bluish or white bloom or powder.

Pterostigma. A more or less colored mark upon the anterior margin before the apex of a wing, between the costal and the following longitudinal vein.

Pterostigmatical. Pertaining to the pterostigma, or its locality.

Pubescent. Clothed with short, soft, fine hair or down.

Punctiform. Shaped like a point or dot.

Pyriform. Shaped like a pear.

Quadrangular space. The space immediately beyond the basal one and in front of the median space of the wings.

Radius. The vein just behind the subcostal one.

Raptatorial. Adapted for seizing prey.

Recurved. Curved backwards.

Reniform. Kidney-shaped.

Reticulated. Furnished with veining or marking like network.

Reticulation. Veining, or marking like the meshes of a net.

Rhinarium. The nostril-piece; a portion of the *nasus,* or its equivalent when reduced in size.

Rhombical. Quadrangular, with two opposite angles acute and two obtuse.

Rhomboidal. Somewhat in the shape of a rhomb.

Rufescent. Somewhat reddish.

Rufous. Reddish.

Rugose. Wrinkled; furnished with numerous rough, small elevations like wrinkles.

Rugulæ. Minute wrinkles.

Rugulose. Minutely wrinkled.

Salient. Projecting; jutting out.

Sanguineous. Blood-red.

Sectors. Longitudinal nerves which strike the principal nerves at an angle, and usually reach the apex or hind margin of the wing.

Semihyaline. Half transparent.

Semilunar. Half-moon shaped.

Sericeous. Having the surface with a silk-like gloss, usually from minute, dense hairs.

Serrated. Having prominences like saw-teeth.

Seta. A bristle-like appendage, such as at the tail of *Ephemera*, &c.

Setaceous. Bristle-like; resembling a bristle.

Setæ. Plural of *Seta*.

Setiform. Bristle-shaped.

Sinuated. Scooped out, or broadly shallowly excavated on a margin.

Spur. Stiff bristle-like appendages upon the *tibiæ*. In the Phryganeæ they are either at the tip or in the middle of the tibiæ; their number affords an important character for classification, and is expressed by three figures, meaning the three successive pairs of feet; thus 2, 4, 4, means two terminal spurs on the fore tibiæ, two terminal and two middle ones on the middle tibiæ, and two terminal and two middle ones on the hind tibiæ.

Stramineous. Straw-colored; yellow.

Stria. A line, usually depressed, sometimes composed of punctures.

Striæ. Plural of *stria*.

Striated. Charged with striæ.

Subaduncate. Somewhat hooked or curved.

Subcinereous. Somewhat gray.

Subcosta. The vein just behind the *costa*.

Subhyaline. Almost transparent, or water-colored.

Subimago. A state of *Ephemera*, &c., wherein the wings, &c., are covered with a membrane, which is cast off when it becomes an *Imago*.

Submarginal. Just behind the margin.

Submedian nerve. The longitudinal large nerve just behind the *median*.

Subnude. Almost without clothing; without hairs, &c.

Subocular. Beneath the eyes.

Subrect. Almost straight.

Subscabrous. Indistinctly rough.

Subulate. Shaped like an awl.

Sulcus. A groove-like excavation.

Sulphureous. Of a color resembling sulphur.

Suture. A seam, or impressed line; usually between segments.

Tarsus (plural **Tarsi**). The terminal, almost always jointed divisions of the foot of an insect, immediately after the tibia.

Teneral. A state of the *imago* after exclusion, in which it has not fully completed its coloring, clothing, &c.

Testaceo-hyaline. Transparent, with a slight tinge of dull reddish.

Testaceous. Dull brick-color.

Tetragonal. Having four sides or angles.

Thorax. The second primary segment of the body, bearing the legs and wings.

Thyridium. A small pale or almost transparent spot near the anastomosis of the disk of the wings in *Phryganina*.

Tibia. The shanks; that part of the leg between the femur and tarsus.

Trapezoidal. Four-sided, with two sides unequal and parallel.

Triangle. A three-sided figure; found in the front wings of *Libellula* near the base.

Triarticulate. Composed of three joints or articles.

Trifid. Cleft into three ends.

Trifoveolated. Furnished with three pits or foveæ.

Trigonal. Triangular, three-sided.

Trilobed. Having three lobes.

Triquetral. Having three more or less long angles.

Trochanters. The joints of the legs situated between the *femora* and *coxæ*.

Truncated. Cut square off.

Tuberculoid. Resembling a tubercle.

Tuberculose. Covered with tubercle-like prominences.

Unguiculus. A nail, like that at the extremity of the *tarsus*.

Unguiculi. Plural of *Unguiculus*.

Unique. A single individual of a kind.

Vaginated. Covered with a sheath-like plate, or *vagina*.

Valvule. A small valve-like process.

Venter. The under surface of the *abdomen*.

Ventral. Pertaining to the under surface of the abdomen.

Verrucose. Covered with wart-like prominences.

Vertex. The upper part of the head, just above the *front*.

Vesicle of the penis. The bag-like appendage on the second ventral segment of the male dragon-fly.

Villose. Clothed with soft, rather long, hair.

Violaceous. Violet-colored.

Viridescent. Somewhat greenish.

Vulva. The orifice of the female genital tube.

Vulvar. Pertaining to the vulva.

Vulvar lamina. The scale or appendage upon the ventral surface of the eighth segment in the female dragon-fly.

To those desirous of becoming better acquainted with the terminology of Neuroptera, especially that of the neuration of the wings, the following inexpensive little work may be recommended: *Neuroptera austriaca*, by Friedr. Brauer and Franz Loew, Vienna, 1857, with five plates. Although written in German, it will prove useful, on account of its plates, even to those not familiar with that language.

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CORRECTIONS AND ADDITIONS.

Page 2, line 28, place semicolon instead of comma after *yellowish*.

" 4, line 2, add: "with a distinct fovea in the middle," which is occupied by a minute, elevated point.

" 5, line 7, dele last e in ferruginous; also on page 30, line 5, and wherever found so spelt.

" 60, bottom of page, dele diæresis from a in Hagen.

" 64, line 19, *for* Mecistogastur *read* Mecistogaster.

" 66, line 24, place a comma after the word *front*.

" 70, line 16, place a comma before the word *pruinose*.

" 76, line 21, remove the comma from behind the word *exteriorly*, and place it before.

" 78, line 21, add the word *with*, to the clause: a dorsal line, &c.

" 85, line 27, place a comma before and after *brassy-green*.

" 118, line 33, place a semicolon in the stead of comma before *beneath*.

" 131, line 30, place a comma after *narrowed*.

" 143, line 22, pl. xxxviii: change to pl. xlviii.

" 170, bottom of page, *for* Huastee *read* Huastec.

" 218, line 34, *for* little *read* dot.

" 223, line 19, place a comma after *side*.

" 224, line 1, place a comma after *beneath*.

" 256, place after description of *Limnophilus radiatus*, Hab. N. W. Territory (Say).

SMITHSONIAN MISCELLANEOUS COLLECTIONS.

SYNOPSIS

OF THE DESCRIBED

LEPIDOPTERA

OF

NORTH AMERICA.

Part I.—DIURNAL AND CREPUSCULAR LEPIDOPTERA.

COMPILED FOR THE SMITHSONIAN INSTITUTION

BY

JOHN G. MORRIS.

WASHINGTON:
SMITHSONIAN INSTITUTION.
FEBRUARY, 1862.

ADVERTISEMENT.

THE present "Synopsis of North American Lepidoptera" has been compiled by the Rev. Dr. J. G. Morris, of Baltimore, at the request of the Institution, to serve as a companion to the Catalogue published in 1860. The work is necessarily incomplete, claiming to be nothing more than a compilation of the published descriptions of the species of the same order; but its publication has been earnestly urged, as tending to facilitate a knowledge of an order of insects of great economical importance.

Dr. Clemens, of Easton, Pa., has made a number of important additions and corrections while the work was passing through the press, besides furnishing an original Appendix.

The Institution is also under obligations to Dr. J. L. Leconte, Prof. S. S. Haldeman, Mr. W. H. Edwards, and Dr. B. Clemens, for assistance in correcting the proofs of the work.

JOSEPH HENRY,
Secretary S. I.

SMITHSONIAN INSTITUTION,
WASHINGTON, February, 1862.

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COLLINS, PRINTER.

PREFACE.

It is a gratifying fact that the science of entomology is making rapid progress in our country, and that so much has already been accomplished by industrious students. There is an increasing demand for books on this subject, but as yet none has been published professing to describe all the species of any one order of our insects. Admirable monographs of some families and genera of Coleoptera have been published by Dr. Leconte and others, and of our Sphingidæ by Drs. Harris and Clemens. Other entomologists, as Say, Melsheimer, Peale, Fitch, Ziegler, Haldeman, Uhler, and a few others, have contributed essentially to the discrimination of the species of various orders, but thus far no more comprehensive work has been attempted. Dr. Harris's invaluable book on the insects of New England injurious to vegetation, approaches the nearest to such a work of any that have appeared in our country. The splendid and costly volume of Boisduval and Leconte on our diurnal butterflies, published in Paris, 1833, has never been finished, and contains but twenty-one genera and ninety-three species. Foreign naturalists have described hundreds of our species, but their descriptions are scattered through a number of journals and other works not easily accessible to the American student.

I have attempted in this work to bring together in as narrow a compass as possible all our described Lepidoptera, embracing the Rhopalocera and the first two tribes of the Heterocera. Thus all our known diurnals, Sphinges and Bombyces, are included, down to the Noctuidæ proper. The latter will probably be taken up at some future time. I have collected the descriptions from many different authors, to whom due credit is given, but I have omitted some of the references to books, having given them in full in my catalogue

of North American Lepidoptera, published by the Smithsonian Institution, which students will, of course, consult, if they desire to know the literature of the species. For the same reason, I have also omitted the list of abbreviations.

With the generous permission of Dr. Clemens, of Easton, Pa., I have incorporated nearly the whole of his admirable synopsis of North American Sphingidæ, published in the Journal of the Academy of Natural Sciences, Philadelphia, 1859, only omitting some minor details and the references to other authors. I have also added his descriptions of Arctiidae, published in the Proceedings of the Philadelphia Academy for Nov., 1859. He has himself furnished an appendix containing many new and original views in regard to the classification of our Lepidoptera, with descriptions of genera and species.

In a supplement will be found a notice of such species as have come to my notice up to the present date, principally from the publications of Mr. S. H. Scudder and Mr. Edwards. The latter gentleman has also supplied some important rectifications of synonymy.

I have inserted descriptions of what are deemed by some to be distinct species, but which are regarded by others as mere varieties, in order to give their authors an opportunity of being heard, and that readers may conveniently compare them.

As regards the classification, I have chiefly adopted that of Dr. Herrich-Schaeffer, of Ratisbon, with some modifications of Walker, of the British Museum. No doubt, changes will hereafter be found necessary.

J. G. MORRIS.

Baltimore, December, 1861.

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INTRODUCTION.

(FROM THE GERMAN OF V. HEINEMANN [1])

BUTTERFLIES are insects having six feet and membranous wings covered with minute scales. They undergo a perfect transformation; the caterpillar or larva, furnished with ten to eighteen feet, is hatched from the egg, and after various moulting, is changed into the pupa, from which after a longer or shorter period, the perfect butterfly comes forth. It performs its destined office, the female deposits her eggs and dies.

The butterfly consists of the body and members; the former is

Fig. 1.

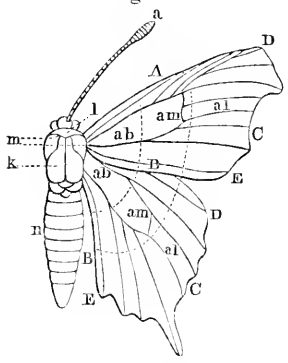
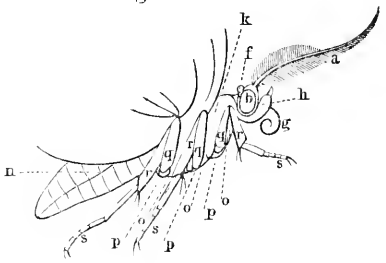


Fig. 2.



composed of head, thorax, and abdomen; the members are the feet and wings.

[1] Die Schmetterlinge Deutschlands und der Schweiz. Systematisch bearbeitet von H. v. Heinemann. Braunschweig. 1859. F. Vieweg und Sohn.

HEAD, *caput*. Figs. 3 to 7.

Fig. 3.

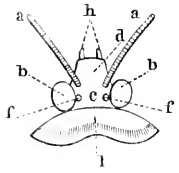
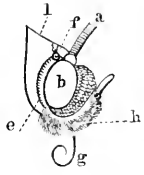


Fig. 4.



The head is located in front of the thorax and separated from it, in most instances, by a very indistinct segment. On both sides are situated the large globular reticulated eyes, *oculi*, b; between them and above is the *vertex*, c; in front is the *frons*, d; and below at the end is the mouth, *os*. The orbits of the eyes, *orbita*, fig. 4, e, are often distinguished by color and the character of the scales. Between the *vertex* and *frons* are the feelers, *antennæ*, a, near the eyes, behind them at the *orbita*, or at a little distance from them in many species, are two small, round, smooth elevations, which are called simple eyes, *ocelli*, f.

The parts of the mouth are but little developed in butterflies. The proboscis or tongue, *lingua*, g, is composed of the two lower jaws (*maxillæ*) grown together as a double tube and usually separated only at the end, and which, for the most part, is corneous and spiral. It is seldom absent, or consists only of two slender, soft threads. Under the tongue are placed the two *palpi*, h, which are three jointed; above these in many nocturnal moths there are in addition two *palpuli*, figs. 5 and 6, i. The *palpi* are of various

Fig. 5

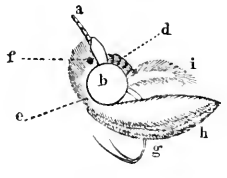


Fig. 6.

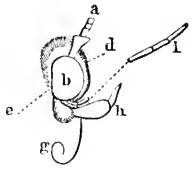
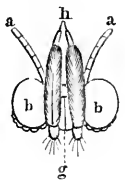


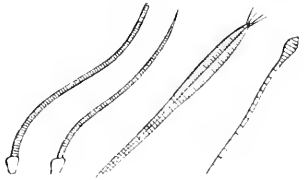
Fig. 7.



form and size, sometimes scarcely visible, sometimes as long as the head and thorax together; the scales on the *palpi* are also of various density; the second joint is usually the longest and most densely scaled, the terminal joint is, for the most part, slender and pointed, frequently setaceous.

The feelers (*antennæ*) vary also in length; sometimes not exceeding the breadth of the head, and sometimes much longer than the length of the body. They are *filiform* (thread-like) when the shaft is of equal thickness throughout the length, fig. 8; *setiform* (bristle shaped), when it becomes thinner towards the point, fig. 9; *fusiform* (spindle shaped), when it is thickest in the middle and thin at the root and point, fig. 10; *clavate* (club form), fig. 1, a, when it gradually thickens towards the summit, and *capitate* (knob form), fig. 11, when it suddenly enlarges at the end.

Fig. 8. 9. 10. 11.



With regard to their covering, the antennæ are either naked, or finely or compactly ciliated, fig. 12, or furnished with two single hairs on each segment, fig. 13, or tufted, fig. 14.

Fig. 12.

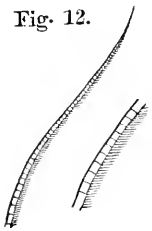


Fig. 13.

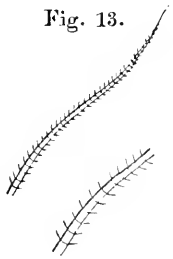


Fig. 14.

The processes of the antennæ are either in the form of obtuse *pyramidal* teeth, fig. 15, or serrate, fig. 16, or pectinate, fig. 18.

Fig. 15.

Fig. 16.

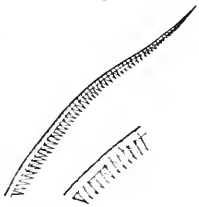


Fig. 17.

Fig. 18.

A comb-like or pectinate process from the under side of the antennæ is called *lamellate*, fig. 17. Frequently the processes themselves are ciliated, the pectinations equal on both sides, and the pyramidal teeth usually furnished at their summit with short ciliæ.

THORAX. Figs. 1, 2, k.

Fig. 1.

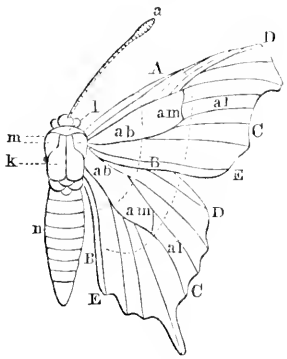
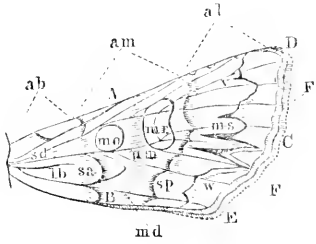


Fig. 20.



The thorax in front, bears the head; behind, the abdomen; beneath, the legs, and on the sides, the wings; the fore part, *collare*, l, and the shoulder-covers, *scapulæ*, m, which cover the roots of the wings, are often prominent. Besides this, the scales above often form peculiar elevations.

ABDOMEN. Figs. 1, 2, n.

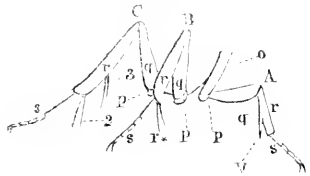
This consists of six to seven rings, the segments of which are for the most part discernible under the scales. These segments often have above, or on the sides or behind, tufts of hair.

LEGS, *pedes*. Figs. 2, 19.

There are three pairs of legs, *pedes antici*, A, *pedes medii*, B, and *pedes postici*, C. They are composed of the *coxa*, by means of which the leg is inserted into the body, o, the *trochanter*, p, which unites the *coxa* and the *femur*, q; the *tibia*, r, and the feet, *tarsi*, s. The *tibiæ* have usually two spurs, *calcares*, t, at the end; the hind tibiæ often have two behind the middle, u; the fore *tibiæ*

occasionally have an emargination on the inner side, the upper edge of which is often prolonged into a spur, v.

Fig. 19.



WINGS, *alæ*. Figs. 1, 20—28.

There are two pairs of wings, the fore wings, *alæ anteriores*, fig. 20, and hind wings, *alæ posteriores*, fig. 21, indifferently called *primaries* and *secondaries*, or *superiors* and *inferiors*—sometimes rudimentary or imperfect in the females, very seldom entirely wanting. The primaries lie with their hind edge on the fore edge of the secondaries, and cover the latter entirely in most of the nocturnal moths when in a state of repose. The secondaries are often folded together when at rest, and in that case usually have on the upper edge near the root, a strong elastic, sometimes double hair or bristle, which draws itself through a hook on the under side of the primaries and serves to maintain or render more easy the expansion of the secondaries. This is called the *frenulum*, fig. 21, fr. This instrument is wanting in nearly all butterflies, which do not fold the secondaries when at rest.

The wings have three edges or margins, the anterior margin, *margo anterior*, on the upper side, A, the interior margin, *margo interior*, opposite the anterior, B, and the posterior margin or *seam*, *margo posterior* or *limbus*, C, which is opposite the root of the wing, *basis*, and binds the two other margins. The angle made

Fig. 20.

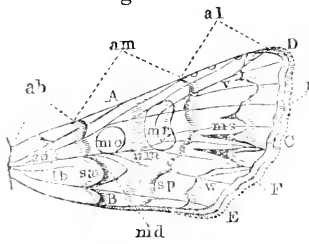
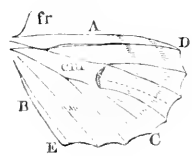


Fig. 21.



by the anterior margin and the posterior, is called the *anterior angle*, D, on the secondaries; on the primaries, this angle is called the *apex;* the angle between the posterior and interior margins E, is called the *posterior angle* on the primaries, and the *anal angle* on the secondaries. In many of the *Tineidae*, the interior margin and posterior angle are wanting, because the wings are very narrow and lanceolate, the edge proceeding in a regular curve from the apex to the base, figs. 27, 28.

The external limit or boundary of the wing is the *linea limbalis*, the scales extending beyond that are called the *fringe*, *ciliæ*, fig. 20, F. In some micro-lepidoptera, especially in those with narrow wings, these *ciliæ* are hair form and very long, and often longer on the secondaries than the breadth of the wing. A line of darker shade, parallel with the margin, often runs through the fringe. The margin is *straight*, *rectus*, when it proceeds in a straight direction; *curved*, when it forms a concave curve towards the base, fig. 20; *sinuate*, when it makes a convex curve towards the base, fig. 24; *entire*, when it forms an *even*, straight, curved or sinuate line, fig. 24; *undulate*, when it makes small rounded indentations, fig. 20; *dentate*, when there are sharp, angular, closely connected, teeth-like projections, fig. 21; *cucullate* (hood shaped) when small, rounded emarginations run into sharp angles toward the base, and *lobate*, when these emarginations are larger, fig. 23.

Fig. 22.

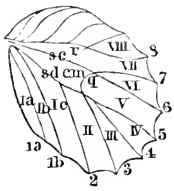


Fig. 23.

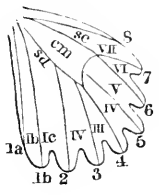
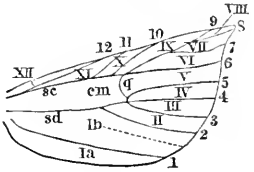


Fig. 24.



The wings themselves consist of a skin-like membrane which are held in a state of expansion by the ribs or nerves, *costæ*, running across or through them. The structure and arrangement of these *costæ* are of great importance in the systematic division of butterflies, and hence a special description of this structure and the determination of each costa are necessary, figs. 22—28.[1]

[1] [This nervular system of classification is of comparatively recent date, and is not closely followed in the present work.—M.]

From the middle of the root of each wing two ribs proceed, which usually are united in or behind the middle of the wing, by an interrupted or curved short cross nerve q, thus inclosing a field between it and the root or base. These are called the *anterior median nerve*, also the *subcostal*, sc, and the *posterior median*, or *subdorsal*, sd. From them and the cross nerve, a number of others proceed which terminate on the anterior and posterior margins. These are counted on the posterior margin from the posterior angle toward the anterior angle and are designated by the numbers 2, 3, 4, &c. &c., without any regard to the fact whether they arise separately from the median and cross nerves, or whether two or more unite towards the base and proceed from the common branch.

Besides these, there exist on the interior margin of the wings from one to three nerves (on the primaries usually only one, seldom two), which arise from the base or root, and end on the posterior or interior margin; these are called *dorsal nerves*. These all bear the figure 1, and are distinguished by 1a, 1b, 1c. On the anterior margin of the primaries and for the most part on that of the secondaries, a nerve springs from the root, which is called the *costal* nerve, and which always bears the highest number, as No. 8, fig. 22. On the secondaries of many *Noctuidæ*, this costal nerve unites with the anterior median for a short distance, fig. 21, or it is entirely united with it at the base, so that it seems to proceed from the anterior median itself. The *frenulum* mentioned above is essentially also a nerve, which has remained free from the membrane of the wing. In most butterflies, which have no *frenulum*, there are in the place of it, on the anterior margin, one or more short curved nerves terminating on it, fig. 22. Nerve 5 of the secondaries is often wanting or is less distinct; this is also the case with nerve 5 of the primaries; their position is, however, easily determined by the larger space between 4 and 6, and they as well as other occasionally obsolete nerves are counted, so that each nerve, if possible, may always have the same numerical designation. That nerve at the apex of the primaries on the one terminating nearest to it, is called the *apical* nerve, fig. 24, 8.

The two median nerves with their ramifications, and the costal and dorsal nerves, are most prominent in the structure. Each of the medians runs off into three branches, the anterior of the secondaries into two, so that the individual branches, one after the other, proceed from the principal bough. A more extensive rami-

fication does not occur on the secondaries, and all the branches terminate in the outer margin; so also with the branches of the posterior median of the primaries. On the other hand, the two first branches on the primaries end on the anterior margin, nerves 11 and 10; the third proceeds as nerve 6 to the outer margin, but at or behind the cross nerve it furcates, and nerve 8, which here arises out of it, proceeds usually to the apex or near it, after it has again branched off, and nerve 7 is sent off to the outer margin and nerve 9 to the anterior, fig. 24. Nerve 10 also frequently furcates, in sending one branch towards the outer margin, impinging on nerve 8, usually at the place where nerve 7 originates, so that this is the continuation of that branch, which then cuts nerve 8. There are some deviations from this structure, especially in the micro-lepidoptera, of which the neuration of the primaries is more simple. It is not to be denied that the anterior margin and the apex of the primaries, on which the power of sustaining flight chiefly depends, acquire a greater strength from the complicated nerve structure, whilst the secondaries do not require it, inasmuch as they are closely united with the primaries; but on the other hand, on the interior margin they are furnished with more simple dorsal nerves, which are sufficient to sustain the wider superficies of the wings. The dorsal nerve of the primaries and the costal of the secondaries also appear to bear a mutual relation to each other, and this may also be true with regard to the corresponding margins. Both these nerves often have an inclination to furcate toward the root of the wings. In those cases, for instance, where the costæ of the inferiors after its origin unites with the anterior median, it is essentially a furcation, in which case, however, the one branch constitutes part of the median, or coincides with it.

The spaces between the nerves are called *cells*, *cellulæ*, and are so distinguished by numbers, that the cell always contains the number of the nerve which it follows, counted from the interior margin. Thus the cell between the nerves 2 and 3 is called cell 2; the one between the nerves 3 and 4 is called cell 3, &c. &c. In fig. 25, they are distinguished by Roman letters. The cells, on the contrary, between the interior margin and nerve 2 are distinguished as cell 1a, 1b, 1c, 1d, fig. 26. The cell between the cross nerve and the two medians is called the median cell, *cellula media*, cm. Occasionally it is divided by one or two longitudinal nerves, in which case the distinct parts are called the *anterior median cell*

and the *inferior median cell*, fig. 25, am and cm. In some genera, the cross nerve between nerves 4 and 5 is obsolete, so that the median cell is here open and passes into cell 4. There are also

Fig. 25.

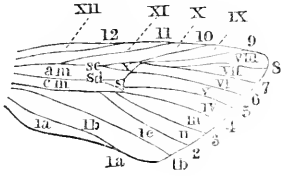
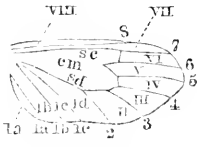


Fig. 26.



sometimes small inclosed cells at the median, called *accessory* cells, which are either situated at the root of the secondaries, fig. 22, r, or *intrusive* cells, as fig. 25, s, or *appendicular* cells, as fig. 25, x.

In the family of *Tineidæ* with lanceolate secondaries, the nerve structure declines. The median cell is indistinct or entirely obsolete, for all the nerves arise either from the root or other nerves, or lose themselves in the membrane in the vicinity of the cross

Fig. 27.

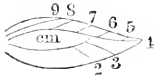


Fig. 28.

nerve. The number of nerves, especially in the secondaries, also diminishes.

In order to distinguish the wings lengthwise, they are divided into three fields or areas, the *basal area*, figs. 1 and 20, ba, the *middle area*, ma, and the *limbal area*, la. In many genera, these areas or fields on the primaries are marked or distinguished by simple, double or triple cross lines or narrow bands, which are called, fig 20, sa, *transverse anterior* (extra basillaire) or *posterior*, sp (ligné coudée). These transverse bands or streaks are most distinct and common in the *Noctuidæ*, fig. 20. In these, there is in addition a cross line between the base and the anterior line, which does not extend down to the interior margin, and which is called the *basal half line*, sd (*demi-ligne* of the French); and another conspicuous cross line between the posterior line and the limb, called the *undulate line*, rr (ligne-subterminal). In the field or area, between these two, there are often arrow-shaped spots, which

are called *sagittate* spots. Besides these, the *Noctuidæ* or *moths*, have three distinguishing marks in the middle area; one in the cell, 1b, called the dentiform spot; a small, usually round one in the median cell, called the *orbicular*, mo, and behind it, a larger, kidney-shaped spot, called the *reniform*, mr. The two latter are often surrounded by a double edge, lighter than the ground color. Between both, there is usually drawn across the whole wing, a darker band, which is called the *transverse median shade*, am. Some species have a dark square spot between the two spots in the median cell, which often extends itself in a pyramidal form over the *orbicular* towards the root, so that both spots form a sort of recumbent pyramid, and is called the *pyramidal* spot. The posterior transverse streak alone is for the most part continued over the secondaries, which is then called, on both sides of the wing, the *arcuated line*.

The *reniform* mark appears on the under side as the *median lunule*, and all the dark spots on the cross nerve of both sides of the secondaries bear the same name, fig. 21.

In general, the structure of the several parts of the butterfly, as far as this is necessary to the determination of the species, genus, etc., can easily be recognized, without dissection. Difficulties sometimes occur in the frequently indistinct simple eyes, *palpuli* and *frenulum*. The last is usually present in species which fold their wings, when in a state of rest. A careful examination with a magnifying glass will readily detect the presence of this member. Much more difficult is a discrimination of the nerve structure, inasmuch as the nerves are frequently so covered with scales, that without removing them, the nerves cannot be seen. In this case, the under side of the wings should be particularly examined, inasmuch as the nerves on this side are more distinct than on the other. But if this will not suffice to determine all the points desirable to be known, the scales must be removed. In order to accomplish this, either take a sharp, fine penknife and move the blade or back gently over the nerves on the under side of the wings, until the nerves become distinct, or rub the whole wing with a soft, blunt hair pencil until all the scales are removed, but on the upper side only, when you wish to observe the furcation of the dorsal nerves of the primaries. This operation can be most satisfactorily performed when the specimens are fresh.

SYNOPSIS OF THE GENERA.*

Section I. **RHOPALOCERA.**

Antennæ filiform, terminating in a knob or club. Wings, at least the primaries, elevated in repose; no bristle or *frenulum*; no *stemmata* or simple eyes—flight diurnal.

Fam. I. **Papilionidae.**

Larva with two retractile tentacles on first segment. Eyes prominent; palpi short; six feet adapted for walking; wings wide, nerves distinct, abdominal edge of the secondaries concave, discoidal cell in both wings closed, hooks of the tarsi simple, abdomen free.

A. Club of antennæ arcuate;
Wings wide, secondaries with long tails or lobed. **Papilio.**

B. Club straight;
Primaries transparent at the summit, two black ocelli in the discoidal cellule, abdomen of the female with a corneous pouch. [No species east of the Rocky Mountains.] **Parnassius.**

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* [The present synopsis is believed to be approximately correct and generally agrees with the body of the book as far as the *Rhopalocera* are concerned, but in the *Heterocera* the conformity is not so rigid, owing to the indistinctness of some of our new American genera and an indisposition to create new families in which to place them. Further investigation will be required to determine their proper place in the system. The synopsis, however, gives a tolerably fair exhibit of our Lepidopteral Fauna, exclusive of the *Noctuidæ* proper, which may, however, hereafter be somewhat improved.

The Genus *Pimela*, p. 129, belongs to *Bombycidæ*, inadvertently placed where it now stands.—J. G. M.]

Fam. II. **Pieridae.**

Antennæ truncated at the extremity or clubbed. Secondaries with no concavity on abdominal edge, abdomen received into a groove, color whitish or orange to greenish-white on the upper side.

A. Antennæ abruptly terminating in an ovoid club;
  a. Wings narrow, elongate.
    * Secondaries wider than the primaries. [Mexican.] **Leptalis.**
  b. Wings of ordinary width.
    † Palpi with long fascicled hairs, last article shorter than the preceding.
      α. Antennæ rather long. [Mexican.] **Euterpe.**
      β. Antennæ very short. **Nathalis.**
    †† Last article of the palpi at least as short as the preceding.
      α. An auroral spot at the summit of the primaries, at least in the males. **Anthocaris.**
      β. No auroral spot. **Pieris.**

B. Antennæ truncated at the summit or terminating insensibly in an obconic club;
  a. Wings robust.
    * Primaries angulate. **Rhodocera.**
    ** Primaries not angulate, secondaries entire.
      α. Antennæ rather long, terminating insensibly in a club. **Callidryas.**
      β. Antennæ short, terminating in an obconic club. **Colias.**
  b. Wings thin and delicate. **Terias.**

Fam. III. **Danaidae.**

Palpi remote, not extending much beyond the head, club of antennæ formed insensibly; wings wide, with the edges somewhat sinuous, discoidal cell of the secondaries closed, thorax robust, pectus with white dots, four walking feet.

Secondaries of the males with a black spot in relief. **Danais.**

Fam. IV. **Heliconidae.**

Abdomen slender, elongate; wings narrow, oblong, abdominal edge scarcely embracing the lower part of the abdomen, discoidal cell closed.

Antennæ longer than the head and abdomen, nearly filiform, insensibly thickening towards the extremity, four walking feet. [Only one species; southern.] **Heliconia.**

Fam. V. **Nymphalidae.**

Palpi nearly connivent, porrect, scaly, their anterior face as wide as the sides, discoidal cell nearly always open, nails of tarsi strongly bifid.

A. Antennæ with a flattened club, primaries sinuous. **Agraulis.**
primaries not sinuous. **Argynnis.**
Under side of wings without nacred spots. **Melitaea.**

B. Club of antennæ not flattened;
a. Primaries excised, angular, secondaries with a pale, silvery or golden mark like the letter L or C. **Grapta.**
b. Primaries subtriangular, less excised, apex truncate, palpi very hairy. **Vanessa.**
c. Primaries less angular, palpi less hairy. **Pyrameis.**
d. Eyes naked, anterior legs less hairy. **Junonia.**
e. Primaries rounded at the summit, proboscis very long. **Anartia.**
f. Primaries dentate, sometimes prolonged to a tail. **Nymphalis.**
g. Primaries, fore margin arcuate, angle acute, tail prominent, color coppery. **Paphia.**
h. Primaries slightly dentate, secondaries with ocelli. **Apatura.**
i. Primaries not dentate, subfalciform—no ocelli. **Aganisthos.**

Fam. VI. **Libytheidae.**

Larva without spines; palpi very long, contiguous, in the form of a beak, parallel to the axis of the body; wings angular, rather robust; discoidal cellule of secondaries open. **Libythea.**

Fam. VII. **Satyridae.**

Wings robust, abdominal edge of the secondaries forming a groove; discoidal cellule closed; nervures of the primaries often dilated at their origin.

Costal nervure feebly inflated at base; color pale, dull, livid. [Extreme north.] **Chionobas.**
Veins delicate, color uniform. **Neonympha.**
Costal nervure much inflated, color dark brown; wings ocellate or with black spots. **Erebia.**
One or two veins of primaries inflated; limb of secondaries dentate; secondaries marbled beneath; primaries ocellate. **Satyrus.**
Eyes hairy; base of costal and median nerves of primaries dilated; secondaries lobed. **Calisto.**
Costal nervure inflated; secondaries emarginate, slightly caudate. **Debis.**
The three principal nerves inflated, no ocelli. **Coenympha.**

Fam. VIII. **Lycaenidae.**

Larva onisciform; discoidal cellule closed apparently by a small nerviform prominence.

Small; under side with small spots or ocellated points; often a marginal band of yellow spots; color of males usually blue. **Argus.**
Under side ocellate; color fulvous. **Polyommatus.**
Secondaries with filiform tails; sometimes simply dentate. **Thecla.**

Fam. IX. **Erycinidae.**

Small; six walking feet in the males, four in the females.

Antennæ long, annulated with whitish; abdomen shorter than the secondaries. **Nymphidia.**
Antennæ shorter, not annulate. **Lemonias.**

Fam. X. **Hesperidae.**

Head wide, transverse; antennæ often terminated by a hook.

Primaries triangular, often with pellucid spots; anal angle with no lobe, no silvery spots beneath. **Hesperia.**
Anal angle with a short tail turned outwards, or an obtuse point, silvery spots beneath. **Goniloba.**
Anal angle rounded. **Nisoniades.**
Wings with orange-colored spots; color dark brown. **Cyclopaedes.**
Primaries only erect in repose; disk in many species with an oblique velvety patch. **Pamphila.**
Color brownish, with numerous translucent, angular and square whitish spots. **Syrichthus.**

Section II. **HETEROCERA.**

Antennæ variable, prismatic, pectinate, serrate, moniliform or filiform; wings deflected in repose, secondaries mostly frenate; stemmata or false eyes in many genera. Flight diurnal, crepuscular, most frequently nocturnal.

Fam. I. **Epialidae.**

Proboscis short or obsolete; palpi nearly obsolete; antennæ, moniliform, shorter than the thorax; wings deflected, long, narrow, secondaries semi-hyaline. No stemmata.

Thorax not crested; body pilose; last abdominal annuli of the female forming an elongated oviduct. **Epialus.**

Fam. II. **Cossidae.**

Body stout, pilose, head small, antennæ shorter than half the length of the wings, palpi small, eyes naked, proboscis short or obsolete, wings strongly veined, deflected; flight nocturnal; stemmata none.

Abdomen long, extending beyond the anal angle; hind tibiæ with two pair of spurs; palpi shorter than the head. **Cossus**
Hind tibiæ with only terminal spurs. **Zeuzera.**

Fam. III. **Conchilopodidae.**

Body rather stout; proboscis not visible; antennæ of ♂ simple, rather serrated, pilose at the apex, which is acute; legs stout, pilose; hind tibiæ with four spurs; wings moderately broad, deflexed; abdomen a little tufted at the extremity. Larva onisciform, or flat.

Fore wings, subcostal veins exterior to the disk, bifid, with two nervules from the disk. **Limacodes.**
With one nervule from the disk. **Adoneta.**
Fore wings, subcostal trifid, exterior to the disk. **Empretia.**
Fore wings, subcostal quadrifid, exterior to the disk. **Nochelia.**

Fam. IV. **Zygaenidae.**

Antennæ fusiform cylindric, often pectinate; proboscis long, convolute; wings longer than the body, primaries more narrow, secondaries rounded; stemmata present.

Costal vein bifid at base; antennæ fusiform. **Zygaena.**
Without costal vein. **Procris?** *Clemens.*
Antennæ not pectinate, thicker in the middle than at the apex. **Alypia.**

Fam. V. **Glaucopididae.**

Wings narrow, often limpid or with limpid spots; hind wings short; antennæ pectinated; flight diurnal.

Hind wings without a discal nervule; median vein of hind wings bifid; wings usually hyaline. **Glaucopis.**

Median vein of hind wings trifid; subcostal vein with a marginal branch; discal vein vertical. **Ormetica.**

Hind wings with a discal nervule; median vein of hind wings bifid. **Euchromia.**

Median vein 3-branched. **Cyanopepla.**

Fam. VI. Ægeriadae.

Primaries narrow, usually vitreous to the margin; secondaries shorter, altogether vitreous; abdomen often with a caudal tuft.

Antennæ gradually thickened nearly to the end, curved; proboscis nearly obsolete; male, with a caudal tuft. **Trochilium.**

Fam. VII. Thyridae.

Antennæ feebly thickened in the middle, first article inflated; no stemmata; wings broad, subtriangular, more or less angulate and indented, opaque with semitransparent spots.

Body short and thick, abdomen conical, tufted at the end. **Thyris.**

Fam. VIII. Psychidae.

Proboscis obsolete, palpi hirsute, antennæ pectinate or ciliate, wings more or less rounded. Female mostly apterous.

Antennæ of the male pectinated more than half the length; abdomen of the male very long. Female wingless. **Oiketicus.**

Antennæ of the male pectinated almost to the apex; abdomen extending beyond the wings. Female wingless. **Thyridopteryx.**

Primaries acuminate at the apex. Female winged. **Perophora.**

Fam. IX. Sphingidae.

FORE WINGS ENTIRE.

A. Terminal margin obliquely convex;

Antennæ clavato prismatic, with hook and seta;

Tongue twice or nearly twice as long as the body. **Macrosila.**

Tongue as long as the body, or somewhat longer. **Sphinx.** **Dolba.**

Tongue two-thirds as long as the body. **Pachylia.** **Darapsa** *pars.* **Lapara.**

Tongue about one-third as long as the body. **Ceratomia.** **Daremma.**

Tongue as long as palpi. **Ellema.**

Antennæ slender, minutely serrate-setose;
Abdomen more or less tufted;
Tongue moderate. **Oenosandra.**
Tongue rather short. **Perigonia.**
Tongue one-half as long as body. **Macroglossa.**
Antennæ subclavate or fusiform;
Abdomen not tufted at the tip. **Arctonotus.** **Deilephila.**
Abdomen tufted at the tip. **Sesia.** **Macroglossa.**

B. Terminal margin wavy. **Anceryx.***

C. Terminal margin nearly straight or slightly sinuate;†
Antennæ with a long hook;
Tongue two-thirds as long as the body. **Pachylia.**
Tongue as long as the body. **Philampelus.**
Antennæ somewhat fusiform, rather short;
Tongue as long as the body. **Chaerocampa.**

D. Terminal margin excavated by the tip, convex from the middle;
Abdomen without apical tuft;
Tongue not quite as long as body or as long. **Ambulyx.** **Pergesa.** **Chaerocampa** *pars.*
Tongue nearly obsolete. S. Juglandis ♂.
Tongue about half as long as the body. **Darapsa.**
Abdomen with apical tuft;
Fore wings with silvery streaks. **Calliomma.**

FORE WINGS NOT ENTIRE.

Fore wings indented above interior angle;
Abdomen with apical tuft. **Proserpinus.**
Abdomen without apical tuft. **Unzela.**
Fore wings excavated near tip and anterior angle. **Thyreus** *pars.*
Fore wings truncate at the tips;
Angulated and denticulated.
Tongue nearly as long as the body. **Thyreus** *pars.*
Angulated in the middle.
Abdomen with apical tuft. **Enyo.** **Perigonia.**
Abdomen without tuft or scarcely tufted;
Tongue about as long as palpi. **Smerinthus** *pars.*
Tongue two-thirds as long as the body. **Deidamia.**
Not angulated in the middle. **Perigonia** *pars.*

* *M. antæus* and the ♀ of *S. juglandis.*

† *A. caicus.*

Fore wings denticulated;
With silvery streaks and angulated. **Calliomma** *pars.*
Without silvery streaks, not angulated. **Smerinthus.**

Fam. X. **Drepanulidae.**

Body slender; proboscis inconspicuous, palpi very short, antennæ longer than the thorax, feet slender, naked; wings wide, primaries falcate; antennæ of the males moderately pectinated—of the female scarcely longer. **Drepana.**

Fam. XI. **Saturnidae.**

Antennæ setiform, bipectinate in the male; no stemmata; secondaries wide, fringe short, without a frenulum; body thick, densely pilose.

Antennæ of males bipectinate, females unidentate. **Saturnia.**
Antennæ of both sexes strongly pectinate; wings with vitreous, diaphanous spots. **Attacus.**
Antennæ of the male deeply pectinated to much beyond half the length, minutely serrated from thence to the tips—of the female, simple. **Dryocampa.**
Antennæ of the male merely serrated for more than one-third; of the female, simple. **Ceratocampa.**

Fam. XII. **Bombycidae.**

Antennæ in both sexes pectinated, strongly in the males; body robust, pilose; wings strong; cocoons of the larvæ silky, hence called *spinners.*

A. Limb of the wings denticulate;
  a. Antennæ very short.
    a. Body thick. **Gastropacha.**
B. Limb of the wings not denticulate;
  a. Antennæ of the male equally pectinate.
    † Primaries with veins not punctate.
    ○ Primaries with no pale discal spot; subacuminate at the apex. **Clisiocampa.**
    — Primaries rounded at the apex. **Pimela.**
    †† Primaries, veins punctate. **Artace.**

Fam. XIII. **Notodontidae.**

Body usually robust, pilose, extending beyond the wings; antennæ of the male usually pectinate, rarely simple—of the female, simple, rarely pectinate; wings entire, often long.

Antennæ of the female pectinate. **Cerura.**
Antennæ of the female serrate. **Notodonta.**
Antennæ of both sexes pectinate. **Ichthyura.**
Antennæ of the male pectinate, naked at the apex. **Heterocampa.**
Antennæ of the male not pectinate to the apex. **Edema.**
Antennæ setaceous, minutely ciliated. **Eudryas.**
Antennæ of male minutely pectinated; of female minutely serrated. **Datana.**
Antennæ moderately pectinated. **Nadata.**

Fam. XIV. **Arctiidae.**

Stature robust; stemmata conspicuous; maxillæ short; antennæ moderate, those of the female, when not nearly obsolete, bipectinate or ciliate, sometimes serrate or simple; abdomen thick, often maculate; frenulum conspicuous; flight often heavy, nocturnal.

Thorax not fasciculate, wings rounded. **Arctia.**
Primaries not dilated; body maculate. **Spilosoma.**
Wings rather long, third article of palpi very short. **Lophocampa.**
Body slender, third article of palpi globose. **Nemeophyla.**
Antennæ simple, ciliate; abdomen not extending beyond the wings; costa of primaries straight. **Phragmatobia.**
Primaries long. **Ecpantheria.**
Antennæ in both sexes simply ciliate, with two strong *setæ* at each joint. **Callimorpha.**
Body fusiform; antennæ minutely pectinate. **Apantesis.**
Antennæ deeply pectinate; tibiæ with only terminal spurs. **Orgyia.**
Antennæ simple in both sexes—those of the male subpilose below. **Deiopeia.**
Antennæ of male deeply pectinate—of female moderately so. **Dasychira.**

Fam. XV. **Lithosiidae.**

Body slender, elongate; no stemmata. Antennæ usually ciliate or simple. Thorax not crested. Abdomen not extending beyond the wings, or very little. Wings often subelliptical, primaries narrow, secondaries often twice as wide as the primaries. Frenulum conspicuous. In repose, the primaries plicate.

Antennæ setaceous, simple; wings not long. **Eustixia.**
Antennæ setaceous, simple, shorter than the body; wings narrow. **Eubaphe.**
Antennæ setaceous, simple, minutely pubescent; wings long, narrow. **Mieza.**

Antennæ of the male setaceous. **Gnophris.**
Antennæ deeply pectinated. **Lagoa.**
Antennæ setiform, scarcely ciliated in the males; wings rather broad, semi-diaphanous, rounded. **Nudaria?**
Antennæ rather deeply pectinated; wings narrow, rather long. **Lerina.**
Antennæ moderately pectinated; wings moderately long and broad. **Apistosia.**
Antennæ moderately pectinated; wings rather long and narrow. **Ardonea.**
Wings moderately broad, not long. **Hypoprepia.**
Wings very narrow, somewhat pointed. **Lymire.**
Wings narrow, not long. **Percote.**
Hind wings much broader than the fore wings. **Lithosia.**

Fam. XVI. **Ctenuchidae.**

Hind wings without costal vein; subcostal bifid from the origin of the discal; discal vein simple, angulated usually beneath the middle of the disk; median vein 4-branched.

Wings very narrow; hind wings broader than the fore wings; antennæ moderately pectinated in the male. **Acoloithus.**
Hind wings narrower than the fore wings; rather deeply pectinated in the male. **Aglaope.**
Wings broad or narrow, elongate-trigonate; antennæ deeply pectinated in the male. **Ctenucha.**
Fore wings rather broad, obovate; antennæ rather thick, tapering at the tips, pectinated. **Malthaca.**

Fam. XVII. **Lycomorphidae.**

Hind wings without costal vein; subcostal bifid; median 3-branched.

Wings narrow; fore wings nearly fusiform; antennæ biserrated or very minutely pectinated. **Lycomorpha.**

Fam. XVIII. **Melameridae.**

This family has much affinity to the *Glaucopididæ*, and also to the *Pyralites*. Wings generally more or less black, occasionally with a metallic hue, frequently adorned with bright colors or partly limpid. All the species are Mexican or West Indian.

Body nearly linear and cylindrical; wings black, generally narrow, with yellow, luteous or white stripes, bands or spots. **Josia.**
Wings mostly limpid; generally long and narrow. **Dioptis.**
Wings rather broad; fore wings not angular. **Uraga.**

Fam. XIX. **Pericopidae.**

Species large, often with pale dots on the head and thorax; wings ample, more or less vitreous. Mexican and West Indian.

Wings long, rather broad, more or less semi-hyaline. **Pericopus.**
Wings long, rather narrow, with semi-hyaline spots. **Composia.**
Wings ample; fore wings with a semi-hyaline band. **Eucyane.**

Fam. XX. **Nyctemeridae.**

Some of the genera, like a few of the *Pericopidæ*, have much resemblance to the *Rhopalocera*. The body is slender and the wings ample, and they have likewise a general resemblance to some of the *Geometrites*. They are nearly all Mexican and West Indian.

Wings moderately broad; fore wings straight in front, rounded at the tips, oblique along exterior border; antennæ moderately pectinated. **Caralisa.**
Wings long and narrow; antennæ of ♂ minutely pectinated. **Eubule.**
Wings short, somewhat triangular; antennæ of ♂ pectinated on both sides. **Psycomorpha.**
Wings broad, not long, generally black with semi-hyaline white spots. **Melanchroia.**

LEPIDOPTERA

OF

NORTH AMERICA.

Sec. I. RHOPALOCERA.

Antennæ filiform, terminating in a knob or club. Wings, at least the primaries, elevated in repose; no bristle or *frenulum* at the anterior edge of the secondaries. No *stemmata* or simple eyes on the vertex. Flight diurnal.

Fam. I. PAPILIONIDAE.

Larva elongated, with two retractile tentacles on the first ring. *Perfect insect* with the abdominal edge of the secondaries concave. Discoidal cellule closed. Hooks of the tarsi simple. Six feet adapted to walking in both sexes.

PAPILIO Linn.

Head large; eyes prominent; palpi very short, joints scarcely distinct; antennæ elongate, club pyriform; body, more or less hairy, free from the wings; wings robust, borders more or less dentated, often terminated by a tail; central cell closed; nerves prominent.

Larva smooth, or bearing fleshy tubercles; provided with two retractile tentacles protruding from the first segment; emitting a strong odor when alarmed.

Chrysalis without metallic spots, moderately angular, occasionally a horn on the back; head square, bifid, or truncate; fastened by the tail and suspended by a thread across the back.

1. **Papilio turnus** *Linn.* Boisd. et Lec. pl. 6, 7. Say's Amer. Ent. pl. 1. Pal. de Beauv. VII, pl. 2. Lucas, Hist. Nat. des Pap. Exot. pl. 118. Cram. Pap. Exot. pl. 38. *P. alcidamas* Cr.

Wings pale yellow, border black—that of the primaries divided by eight or nine yellow spots; wings traversed by four unequal black bands.

Secondaries with a marginal range of six lunules, two rufous, four yellow; anal emarginations bordered with yellow. These lunules are surmounted with groups of bluish atoms. Emarginations large, obtuse; tail black, bordered with yellow within.

Under side of primaries similar to the upper, the marginal points forming nearly a continuous ray, preceded by a range of grayish atoms.

Under side of secondaries has the border sprinkled with grayish yellow, with all the marginal lunules rufous in the middle; a range of bluish lunules above the border, three or four of which are surmounted with a little rufous.

Body blackish above; two yellow rays on the thorax, yellowish ray below.

Larva green above, whitish below; sides with seven oblique greenish stripes; between the fourth and fifth segments, a transverse band, yellow before, black behind; on the third segment a lateral, ocellated spot, with two blue pupils; head flesh-color, neck yellow; feeds on various species of *Prunus*.

The chrysalis is brown, more or less deep, with a conical point on the breast.

The perfect insect measures from three to four inches across the wings, and is found in the United States generally.

Boisd.

2. **P. glaucus** *Linn.* (Most probably a *Southern* female variety of *P. turnus.*) Boisd. et Lec. pl. 8, 9. Cram. Pap. Exot. pl. 139. Pal. de Beauv. VI, Liv. pl. 1.

Size and habits, and when held towards the light, showing the markings of *P. turnus;* varies from pale brown to deep black.

Wings blackish brown; primaries, with a marginal series of eight oblong, yellowish spots, preceded by arcuated groups of bluish atoms. Secondaries sprinkled with blue, except at the base; outer limb divided by a range of seven lunules, some yellow, others rufous, surmounted by cuneiform spots of pulverulent

blue, forming one wide arcuated band; outer border dentated; tail spatulate, bordered with yellow inside, as well as all the emarginations of all the wings.

Beneath primaries paler brown, with three blackish bands, proceeding from the anterior margin, the two outer abbreviated, the basal continuous. Secondaries brown; a transverse line gradually narrowing towards its end. Marginal lunules, rufous, slightly bordered with yellow; the band of bluish atoms (in the fresh subject) surmounted by four or five triangular russety spots.

Body black, with two yellow spots on the sides.

Larva similar to that of *P. turnus*.

Inhabits the Southern States.

Boisd.

3. **P. rutulus** *Boisd.* The figure, size, and *facies* of *P. turnus*, of which it is perhaps only a modification. Ann. Soc. ent. de France, X, 2me sér. 279.

Upper side ochry yellow, with the extremity of all the wings rather widely bordered with black; primaries cut by the nerves, and marked with five unequal transverse black bands, the first continuing from the base the whole length of the abdominal edge of the secondaries; the second descending to the anal angle of the latter, and abruptly bending to unite with the first; the third a little divided, and ending on the first branch of the median; the fourth at the extremity of the discoidal cellule and not passing the median; the fifth somewhat shorter; the border of the primaries is divided by a ray of ochry yellow oblong points; secondaries with a streak or blackish arc on the extremity of the discoidal cellule; a marginal row of six crescents, of which the anal is fulvous and the other five yellow; anal emargination bordered with fulvous, surmounted as well as the internal crescent with a group of blue atoms; the exterior edge with wide obtuse teeth, and a spatulate black tail, edged with yellow within, as well as all the emarginations.

Under side similar to the upper, the marginal points forming a continuous ray, preceded by a ray of grayish atoms; that of the secondaries has the border powdered with yellowish gray, the marginal crescents being ochry as above. A row of bluish crescents on the anterior edge of the border. *Body* blackish above, yellowish below, with two black ventral rays.

It differs from *P. turnus* in that the upper side of the secondaries

have not the fulvous crescent on the internal angle, and the under side has not the fulvous crescent in the border, nor the sagittate spots between the border and discoidal cellule of *P. turnus*.

California.—In the spring and summer.

BOISD.

4. P. eurymedon *Boisd.* Ann. Soc. ent. 2me sér. 280.

The general appearance of *turnus*, but the black predominates more, and the bands are nearly white. Ground color very black; primaries with four bands, white a little yellowish; the first at the base; the second before the discoidal cellule; the third, very short, represented by a simple streak at the end of the cellule; the fourth bifid at its summit and united below to the second; a row of marginal oblong points diminishing before the internal angle. Secondaries with two wide whitish bands, or rather with a whitish disk, cut by a black ray as in *P. turnus;* the border divided by a row of five crescents, and two fulvous anal ones; anal emargination fulvous, surmounted, as well as the internal crescent, with a group of blue atoms; tail black, spatulate, edged with whitish as well as the emarginations. Under side of primaries, nearly like the upper. That of the secondaries similar to *turnus* but much more black; the border sometimes divided by fulvous crescents, and sometimes of the ground color, except the two anal and the anal emargination which are always fulvous; all the crescents are surmounted by a row of blue spots. *Body* black above, with two white rays on the thorax; whitish below, with two black ventral rays.

California.

Gray regards *P. eurymedon* as a mere variety of *P. rutulus*. Catalogue of Lep. Ins., in collection of Brit. Mus., pt. 1, p. 24.

BOISD.

5. P. zolicaon *Boisd.* Ann. Soc. ent. 2me sér. 280.

Primaries black, traversed by an oblique, yellow band, divided into eight spots by the black nerves; this band is preceded by two streaks and a spot of the same color; the border divided by eight yellow points. Secondaries with a black arc at the end of the discoidal cellule; abdominal edge black, powdered with yellow, tail linear, black, obtuse, bordered with yellow on one side.

The anal eye bright fulvous, circled with yellow fulvous, body black, with a lateral yellow band.

California.

BOISD.

6. **P. troilus** *Linn.* Boisd. et Lec. pl. 10. Sm. Abb. vol. I, pl. 2. Cram. Pap. Exot. pl. 207. Herbst, pl. 17 (mas.) pl. 20 (foem.). Drury, I, pl. 2. Lucas Hist. Nat. des Pap. Exot., pl. 19. *P. ilioneus*, Sm. Abb.

Wings blackish, dentate, emarginations yellowish white. *Primaries*, with a range of seven or eight spots of pale yellow on the outer margin, gradually decreasing in size upwards. *Secondaries*, with a marginal range of seven greenish lunules, the upper one, orange yellow. Above these, a wide bluish gray band divided by the nervures. The lunule of the anal angle, is orange yellow inside greenish gray outside, tail black.

Under side of primaries, deep brown, two marginal series of yellow spots, besides one or two towards the upper edge.

Under side of secondaries, has two series of rufous lunules, separated by a band of bluish atoms; anal spot rufous.

Body black, with yellow spots on the thorax and a line of yellow points on each side. Expands three inches.

Larva green, with a yellow marginal band; two series of blue points on the sides and in the fourth segment two carneous spots, on the third, a carneous ocellated spot, pupilled with deep blue, on the first, a black band; the under side ferruginous, at the base of the membranaceous feet, a series of seven blue points. Feeds on *Laurus sassafras* and other species of *Laurus*.

Chrysalis a little gibbous, pale ferruginous striated with a deeper tint.

Boisd.

7. **P. asterias** *Fab.* Sm. Abb. I, pl. 1. Cram. Pap. pl. 385. Boisd. et Lec., pl. 4. Lucas Hist. Nat. des Pap. Exot. pl. 20. Haldeman, in Stansbury's Expl. p. 366. *P. troilus*, Sm. Abb.

Wings deep blackish brown, with two macular pale yellow bands; the first, composed of eight spots, nearly triangular, traversing the middle of the secondaries; the second is marginal, and the spots are smaller, eight or nine of which are on the primaries and six on the secondaries, mostly lunular. Besides these, the primaries have one or two spots toward the upper margin, and the secondaries, six or seven blue lunules between the spots. At the anal angle, a rufous spot, with a black point—emargination yellowish—tail black.

Under side of primaries, paler; the first band is pale rufous, except the first two or three triangular spots, which are yellow.

Under side of secondaries, orange, except the two last of the marginal band, which are yellow. In the female the spots of the first band are smaller, sometimes obsolete on the secondaries.

Body black, rufous points on the thorax, and three series of yellow spots on the sides. Expands four inches. United States.

Larva apple green, with a transverse band on each segment formed of alternate bands of black and yellow, excepting on the first three, where the black band is interrupted by the yellow points only towards the spiracles; whilst on the back, the yellow are placed before the black band; three black points on the anterior part of the first segment and two black lines on the head. The feet have black points at their base.

Feeds on *Daucus carota, Anethum fœniculum* and other umbelliferous plants.

Chrysalis grayish, with ferruginous wavy streaks.

Boisd.

8. P. philenor *Fab.* Boisd. et Lec. pl. 11. Sm. Abb. I, pl. 3. Say's Amer. Ent. pl. 1. Cram. Pap. pl. 208. Drury I, pl. 2. Herbst, pl. 19. Lucas Hist. Nat. des Pap. Exot. pl. 8. *P. astinous,* Cram.

Primaries black, with a greenish reflection towards the outer border—emarginations, whitish; in some specimens, a series of whitish spots along the outer border, obsolete in others.

Secondaries blackish, with a greenish hue except towards the base, a range of six whitish lunules—tail black, whitish at the base.

Under side of primaries, dull black; a marginal range of five or six whitish spots.

Under side of secondaries has a brilliant greenish reflection, except at the base, where there is a whitish spot. Seven lunules of bright rufous, surrounded with black. Four or six of those above bordered with white on one side; expands three and a half inches. North America.

Larva brown, with two lateral series of smaller reddish tubercles. The first segment has two long processes—nine of moderate length below and others in the three last segments.—Feeds on *Aristolochia serpentaria.*

Chrysalis grayish violet, back yellowish; head truncate.

Boisd.

9. **P. chalcas** *Fab.* Boisd. et Lec. pl. 5. Herbst, pl. 62; Drur. I, pl. 19. Cram. Pap. Exot. pl. 93. *P. palamedes* Drur. Cr.

Wings olive black, traversed by an interrupted, pale yellow band, continued over the secondaries, formed of triangular spots in the primaries—a yellow spot near the upper edge and nearer the base, a short, yellow, narrow line. Towards the outer edge, a marginal range of roundish, yellow lunules; anal angle, with a bluish crescent; a little dusty yellow between the base and the marginal points. Emarginations, yellow. *Tail* black, with a yellowish ray in the middle.

Under side of primaries, paler; near the base, a transverse line of grayish atoms.

Under side of secondaries is traversed by a rufous line. The transverse band, macular, whitish within, rufous without. The marginal lunules are whitish—the middle rufous, and the interval sprinkled with yellowish dust; a band, also, of blue crescents.

Body black; a yellow line on each side of the thorax and abdomen.

Southern States.—Expands four and a half inches.

Larva green, punctured with pale blue; under size and feet, carneous; head, yellow, ferruginous with a black arc; the third segment has a lateral, carneous eyelet with a blue pupil, surmounted with a blue point. The fourth has a lateral, carneous spot. The green is separated from the reddish, by a marginal, yellow line. Feeds on *Laurus*.

Chrysalis, uneven, or humpbacked; ferruginous on the back, roseous beneath and four ranges of small bluish points.

Boisd.

10. **P. thoas** *Linn.* Boisd. et Lec. pl. 12. Cram. Pap. Exot. pl. 167. Drur. pl. 22. Herbst, pl. 39. Lucas, Hist. Nat. des Pap. Exot pl. 15. *P. cresphontes* Cram. *P. oxitus* Hbnr.

Wings deep black above, traversed by a yellow macular band, extending across the base of the secondaries. The third spot is oblong, surmounted by two or three others. The primaries have besides, four yellow lunules near the inner angle.

The secondaries have a curved series of six or seven yellow lunules; the anal angle has a rufous crescent with a group of blue atoms above it; dentate and the emarginations of both, yellow.

Tail black, with an oval yellow spot.

Under side of primaries much paler; on the base, a large, radiated yellow spot, which fills the discoidal cellule and eight marginal spots.

Under side of secondaries, yellow, divided by six or seven blue lunules, three or four of which are associated with as many ferruginous spots. The anal spot corresponds with that of the opposite side. Expands five inches.

Body yellow; back black; thorax, black above, with two yellow lines. Southern States.

Larva brownish below, back covered with large, whitish blotches, irregular, spotted with brown.

Chrysalis brown, marked with blackish points. Feeds on the orange tree.

Boisd.

11. P. ajax *Sm. Abb.* Boisd. et Lec. pl. 1. Sm. Abb. I, pl. 4. Pal. de Beauv. IV, pl. 2.

Upper side of the wings, blackish brown, with bands, whitish yellow; the first, which is at the base of the primaries, is very small; the second is wide and descends beyond the middle of the secondaries; the third is only a whitish line; the fourth is wide, bifid above, and descends on the disk of the secondaries; the fifth and sixth are short and of unequal length; the seventh is marginal and interrupted.

The secondaries have fewer whitish lunules, two other bluish lunules, and at the anal angle a bilobed red spot, resting on a black crescent, which is cut transversely by a blue line and surmounted by a group of grayish atoms. Emarginations whitish.

Tail black, linear, white at the extremity and on the sides.

Under side paler, a narrow grayish band on the internal side of the marginal band of the primaries.

Under side of secondaries differ considerably from the upper.

The white marginal lunules are preceded by a black streak and the blue lunules by an equal number of grayish crescents. A slightly flexuous scarlet line, bordered with white, separates the two whitish bands. The bilobed spot is surmounted with white. Expands three inches. Southern States.

Body blackish, with two whitish lines on the sides; antennæ brown, with the lower side of the club blackish. Its flight is low, rapid, not sailing.

Larva green, with the stigmata yellow and a tricolored transverse band in the fourth segment, black in the middle, and yellow behind.

Feeds on *Porcelia pygmaea* and *Anona palustris*.

Chrysalis ferruginous, with clearer lines and darker striæ.

Boisd.

12. P. marcellus *Cram.* Boisd. et Lec. pl. 11. Cram. Pap. Exot. pl. 98. Esper, Pap. Eur. Part 1, pl. 51. *P. ajax* Hbnr.

Resembling *ajax* but somewhat larger. *Wings* deeper black, transverse bands more narrow; secondaries more elongate; tail longer, the posterior half of which is whitish. The red anal spot is not bordered with white in front as in *ajax*. It sometimes forms a large round spot, sometimes a transverse ray, and again bilobed, or divided into two spots; no blue crescent between this red spot and the anal emargination; all the whitish bands, more narrow on both sides, excepting that along the abdominal border, which is wider. All the other characters as in *P. ajax*. Southern States. Flight more graceful than that of *P. ajax*.

The *larva* differs much from that of *P. ajax*. It has a whitish ground, striated transversely with violet, with a yellow semi-circular band on the middle of each ring; the band of the fourth ring is bordered before with black. Chrysalis ferruginous. Feeds on *Porcelia pygmæa*.

Boisd.

Gray in Cat. Lep. Ins. Brit. Mus. considers *P. ajax* and *P. marcellus* to be varieties of the same insect. This is now the opinion of all the collectors in this country. One of them declares that *P. ajax* is the spring, and *P. marcellus* the fall brood of the same species.

J. G. M.

13. P. sinon *Fab.* Boisd. et Lec. pl. 3. Cram. pl. 318. Herbst, pl. 45. Drur. 1, pl. 22. (Drury's fig. is not exact; Cramer's, too green.) *P. protesilaus* Drur. *P. celadon* Lucas.

Size of *P. ajax*, and analogous. Wings deep black, with the bands yellowish white, ordinarily a little greenish. The first, at the base, is linear and descends on the secondaries, even to the red spot; the second, of the same width, a little bent, widening on the secondaries; after this, there is a small, very narrow line, sometimes obsolete; then, a band wide in the middle, bifid above, and terminating in a point on the disk of the secondaries; then, a small, short band, a whitish or greenish point, and finally, a marginal,

macular band composed of eight lunules. The secondaries have six whitish crescents, marginal, and a large, red, bilobed anal spot, placed a little obliquely and wider internally.

Tail black, linear, whitish at the end.

Under side of primaries, brownish, on which all the characters of the upper side are visible.

Under side of the secondaries also presents the same bands as the opposite surface, but there is, besides, a red line placed on the black band between the two principal white bands; near the anal angle, this line is bent, as in *P. ajax*, but instead of widening, as in the latter to form two red lunules, it continues in the same width on the disk; this line is bordered with white, but only in the place where it corresponds to the red spot above. Some grayish atoms above the two last white crescents.

Body blackish, with two whitish rays on the thorax; abdomen blackish, *annulated* with white above, grayish below. Antennæ blackish. Southern States.

Larva unknown.

P. sinon is easily distinguished from the neighboring species by its greenish bands, the macular posterior band; the red line on the under side not forming a crescent and the body annulated with white.

Boisd.

14. P. celadon *Lucas.* Guér. Rev. Zool. 1852, 130.

A little smaller than *P. sinon*, with which it has been confounded by Cramer. Upper side of wings, black, with bands of a clear green thus disposed; the first, linear, common, running along the abdominal edge of the secondaries, nearly to the red spot of the anal angle; the second, also common, descends a little lower on the secondaries; the third, very wide, principally in the secondaries, common, and sending out on them two prolongations, which reach the costal edge; on the secondaries it does not extend beyond the intermediary band; the fourth, narrow, not passing the median nervure of the secondaries; the fifth, smaller than the fourth, is placed beyond the summit of the discoidal cellule, and is divided into three spots by the nervures, which are of a russety brown; the sixth, macular, forming, on the second, a range of spots, more or less rounded, nearly marginal, but sinuous and not touching the posterior edge of the primaries, as in *P. sinon*. Under side, like

the upper, with the black inclining towards russety. The secondaries, besides the characters already mentioned, present a marginal range of lunules of a clear green and an anal spot of red vermilion, but much smaller than in *P. sinon*. The external edge is dentated as in *sinon* by a tail less long and entirely black; emarginations less bordered with whitish than in *sinon*. Under side russety white, with the red spot more narrow than above. There is also a reddish, feeble line, which goes from the middle of the edge, without passing the superior nervure of the discoidal cellule; antennæ black; palpi clothed with white hairs; head black, with a yellowish ray on each side, which continues on the sides of the thorax, thorax black: abdomen black, annulated with yellowish white on the sides; below, of this color, with a longitudinal narrow black ray.

Expands 58 mill. California—Oregon?

LUCAS.

15. P. arcesilaus *Lucas*. Guér. Rev. Zool. 1852, 131.

Male, a little smaller than *P. ajax*. Upper side brown black, with bands of a pale yellowish white thus disposed; first, linear, common, touching the abdominal edge of the secondaries so as nearly to join the red spot of the anal angle, from which it is separated only by a small line of black; the second is a little wider; the third, more narrow, not passing the discoidal cellule; the fourth, very wide, bifid in parting from the median nervure: the fifth, very short, wider and less elongated than the third; the sixth, nearly marginal, feeble, interrupted by the nervure; under side of a black more clear, with the same designs as above; upper side of secondaries deeper black, with the spot of yellowish white very large, occupying all the centre and losing itself posteriorly in a space powdered with yellowish; anteriorly, it is interrupted by a black band very short, which proceeds from the middle of the edge; the red spot is large, transverse, oblique and supported behind on two yellowish spots; the exterior edge presents a marginal space of yellow lunules, dentated; tail black, yellow at the extremity. Under side resembles the upper, and has besides in the middle, a red sinuous ray, bordered with black on the internal side at its anterior part, and slightly edged with this color on the external side; the red transverse band is more narrow than on the upper side, edged with white behind, with the lunules of the anal angle pow-

dered with whitish atoms; tail much more edged with yellow on the internal side than above; palpi yellowish white; this color continues on the sides of the thorax, which is black. Abdomen black above, yellow in the sides or below—a ray in each side.

California—Oregon? Expands 62 mill.

LUCAS.

16. P. machaon *Linn.* Figured by most European authors.

Upper side yellow, with a rather wide black border, sinuate within, divided on the primaries by a row of eight yellow marginal points and in the secondaries by a marginal row of six lunules of the same color, of which four or five of the intermediary are largest; all these lunules are preceded by an orbicular spot formed of blue atoms; the anal angle is marked by a reddish yellow ocular spot, surmounted by a whitish violet crescent. Primaries with four black spots along the upper edge, of which the outer one is the smallest and nearly round; the two following are transverse, not passing the median nervure; the fourth is very large, occupying all the base, and powdered with yellowish gray, as well as that part of the border comprised between the marginal points and the ground color; the branches of the median nerve black and dilated. Secondaries have a black arc at the extremity of the discoidal cellule; the abdominal edge black, powdered with yellowish; the contour with short teeth and a black linear tail of moderate length, obtuse at the extremity, bordered with yellow in the internal side; emarginations bordered with yellow as well as the sinus of the primaries.

Under side nearly similar to the upper with all the nervures black and the yellow more mingled with the black and occupying more space. The blue spots of the secondaries are more narrow, somewhat lunulate; the second, third, and sometimes the sixth are each surmounted with a russety spot. Body yellow, with a dorsal band; antennæ black.

California—Europe—Asia.

BOISD.

17. P. villiersii *Boisd.* Boisd. et Lec. pl. 14. *P. devilliersi* Godt.

Nearly same size as *P. troilus*. *Wings* greenish blue, shining, dentated, emarginations white, a marginal range of bluish lunules, much smaller on the primaries than on the secondaries.

Tail moderate, spatulate.

Under side of primaries, shining, blackish bronze to the middle, with an arc of white spots at the end of the discoidal cellule, and a marginal range of silver white triangular spots.

Under side of secondaries, brown, with the origin of the base and outer border, yellowish white; in the middle, three large, silver spots. Towards the edge, a range of five to seven silver spots, separated from the external border by a black zigzag line, surmounted by ferruginous crescents, reposing on a deep bronze ground.

Body black bronze, with white points on the prothorax, breast and sides of the abdomen. Southern States.

Boisd.

18. P. polydamas *Linn.* Boisd. et Lec. pl. 15. Cram. Pap. pl. 211. Drury I, pl.17. Herbst, pl. 10. Seba Mus. p. 39. Merian, Surin. pl. 31. Lucas Hist. Nat. des Pap. Exot. pl. 17.

Size of *P. asterias*. *Wings* greenish black, traversed towards the extremity by a band of yellow more or less pale, of moderate width, somewhat macular; formed, on the primaries, of cuneiform, pointed spots, and on the secondaries, of cuneiform, truncated spots. The primaries sinuate, slightly dentate; the secondaries dentate. Emarginations yellow.

Under side brown; that of the primaries more clear towards the base, with the same markings as above; that of the secondaries is more obscure towards the extremity, with a marginal range of seven reddish brown spots, linear, transverse, a little flexuous, of which the three outer are usually bordered with silver white. At the base, there is also a reddish spot.

Body black, the prothorax, the sides of the breast, and of the abdomen, with rufous spots or streaks.

Georgia.

Larva which lives on *Aristolochia*, is brown, with fleshy spines of the same color; the body radiated with red and each segment having, besides, four ocellated spots, half yellow, half red.

Boisd.

PARNASSIUS Latr.

Head rather small; eyes not prominent: palpi longer than the head, elevated beyond the front, furnished with long and fine hairs, and composed of three distinct, equal articles; the first arcuate,

the second straight, the third linear; antennæ short, terminating in a straight, ovoid, elongated club.

Body thick, hairy; abdomen of the female provided with a pouch or horny valve. Wings, parchment like, nerves prominent, not dentated, and nearly destitute of scales on the under side and towards the summit on the upper side. Secondaries have the abdominal edge sloped, leaving the abdomen entirely free.

Larva smooth, cylindroid, thick, with small tubercles, a little hairy. The first ring provided with a furcate tentacle of the shape of a Y. Head small, round.

Chrysalis cylindrico-conical, powdered with a bluish efflorescence, enveloped between leaves in a light tissue of silk and sustained by transverse threads.

1. **P. clarius** *Eversm.* Bullet. de Moscou, XVI, 539, fig. 1.

Primaries white, with two black streaks in the discoidal cellule; the extremity semitransparent, gray, divided by a row of white spots; internal angle sometimes without spots and sometimes marked with a small blackish spot.

Secondaries white, with two small red ocelli; anal angle with a black arc, often obsolete in the males.

Under side of the secondaries with two ocelli as above; the base usually with the impression of red obsolete spots; the arc of the anal angle black or red. Body blackish, with whitish hairs, very short on the thorax; palpi covered with yellow hairs. The *female* has the anal arc distinct, reddish on the under side; wings divided above by a blackish marginal festooned line; the horny pouch of the under side of the abdomen, large, entirely white and bordered with yellow hairs.

Northern California.

EVERSMAN.

2. **P. nomion** *Fisch.* Fisch. Entomograph. de la Russie, II, pl. 6. Boisd. Icon. pl. 4, fig. 3. Godt. Dup. Suppl. pl. 43. Boisd. Spec. Gen. pl. 2. Gray. Cat. Lep. Ins. Brit. Mus. fig. 316, 409, 410.

Base of the wings black; transverse sinuous ray of the extremity well defined on all the wings; two spots between the discoidal cellule and this ray, on the primaries, marked with reddish; the spot on the middle of the internal edge has the middle of it reddish;

secondaries with a reddish spot at the base; abdominal edge covered with a space more deeply blackish, ascending in the form of an anchor or hook, to the extremity of the discoidal cellule; fringe intersected with black; antennæ strongly annulate with black. Female a little larger than the male, wings powdered with blackish; pouch of the under side of the abdomen small, brownish, not prominent, formed of two wrinkled valves, separated by a longitudinal groove.

Rocky Mountains.

Boisd.

3. **P. clodius** *Menetries.* Voyage de M. Wosnesjensky. *P. clarius*, Boisd.

Very near to P. *clarius* Eversm. but larger; wings of a dead white, a little yellowish (the transparent part and the row of spots on the external edge as in *clarius*.)

On the *under side*, the primaries have the same black spots as in *clarius*, but the two discoidal spots of the anterior edge are very narrow; the base is widely powdered with black; near the internal edge there is a well defined small black spot.

The secondaries have the base powdered with black, the two ocelli are small and irregularly round, pale reddish, with a deep black edge; no anal spot.

Under side paler white and glossy; with the same markings as above but less distinct.

The four spots at the base of the secondaries are pale red, each one limited outwardly by a black trait. (These spots do not occur in *P. clarius*.) Towards the anal angle, there is a cuneiform spot of a similar red, with a black line above and below it, and near it and more outwardly, there is a black point.

The whole body is covered with long, yellowish hairs, which on the front, the anterior of the thorax and under the abdomen are shorter, closer and russety. Expands three inches and a half.

California.

Menetries.

Fam. II. PIERIDAE.

Larva slightly pubescent, somewhat attenuated at the extremity. *Perfect insect* with the abdominal edge of the secondaries without a concavity. Discoidal cellule closed. Hooks of the tarsi unidentate.

PIERIS Schr.

Head rather small, short; eyes naked, moderate; palpi rather long, somewhat compressed, a little cylindrical, clothed with rigid hairs, slightly fasciculate; the last article slender, *nearly as long as the preceding*, forming a small acicular point; antennæ moderate, the joints distinct, the club *ovoid* compressed. Abdomen not robust, a little shorter than the secondary wings. Wings moderately strong, the discoidal cellule closed; the internal edge of the secondaries convex, embracing more or less the lower part of the abdomen.

Larva cylindrical, elongate, pubescent, marked with longitudinal rays and small granules more or less visible.

Chrysalis angular, terminated before by a point more or less long, sometimes nearly smooth, and sometimes furnished with tubercles more or less sharp, attached by the tail and a transverse line.

Pieris may easily be distinguished from the neighboring genera by the antennæ not being truncated, the palpi less compressed, of which the last article is always nearly as long as the preceding; by the less robust body and the wings more thin. *They never have those central silver or ferruginous* spots which are always present on the discoidal cell of the under side of the wings of the true *Colias*. The prevailing color is white, more or less spotted with black.

1. **P. monusta** *Hübn.* Samml. Exot. Boisd. et Lec. pl. 16. Hübn. Pap. Exot. Cram. 151. *P. orseis* Godt. *P. cleomes* Boisd.

Male. Upper surface of primaries, white with a black border, wider at the summit, serrated within. Upper surface of secondaries, entirely white in the males. Under surface of primaries white, with the border pale brown, or yellow ochre.

Under surface of secondaries, yellow ochry, more or less pale, with the border pale brown, and a saffron spot at the base.

The female has an arcuated black line on the middle of the primaries, and a marginal series of black triangular spots in the secondaries.

Body white; thorax obscure; shoulders grayish; neck ferruginous. Antennæ black, annulated with white; tip of the club greenish. Expands two to three inches.

Larva violet, with longitudinal bands of citron; head, feet, and lower part of the body yellow—a little greenish.

Chrysalis pale, yellowish, shaded with blackish, with a raised point on the back.

Feeds on *Cleome pentaphylla.*

Georgia to Brazil.

Boisd.

2. **P. protodice** *Boisd.* Boisd. et Lec. 45, pl. 17.

Male. Primaries white, with a large black trapezoidal spot near the upper edge, and an oblique, macular, black band; the summit, near the border, has four or five black triangular spots on the nervures.

The *upper side* of the secondaries entirely white, sometimes with a small group of blackish atoms near the internal angle.

The *under side* of the primaries resembles the upper, but the black markings are paler—a little greenish at the summit.

The *under side* of the secondaries white, slightly tinted with yellow or greenish, with the nervures more pale or ochry; a slight blackish spot on the border of the discoidal cellule, besides a marginal impression of dark atoms scarcely distinct from the ground color.

The female has the black of the primaries more intense; the secondaries are white, tinted with grayish; exterior edge dark, with five or six white trapezoidal spots.

Under side washed with greenish brown in the nervures, and a submarginal band of the same color.

Expands two and a half inches.

United States.

Boisd.

P. sisymbrii *Boisd.* Ann. Soc. ent. 2me sér. X, 284.

Upper side white; primaries with a subcostal spot; a transverse, interrupted ray, and some longitudinal streaks at the end of the nerves, blackish brown; secondaries without spots.

Under side of primaries similar to the upper, except the streaks, which are powdered with greenish brown.

Under side of secondaries white, with the nerves widely edged with greenish brown, dilated towards the marginal edge, and nearly united between this edge and the cellule by a transverse ray; obsolete, more or less interrupted.

California—rare.

Boisd.

P. leucodice *Eversm.* Figured in Bulletin, Moscow, XVI, pl. 7, f. 2.

Wings on both sides white; nerves black; primaries on both sides, with the usual median spot, occupying the transverse nervure and external fascia, black; secondaries below, with the external fascia, blackish.

Northwestern America.

Eversmann.

P. autodice *Hübn.* Samml. Exot. Boisd. Spec. Gén. 539.

Upper side of the male white; primaries, with some marginal triangular blackish marks at the summit, preceded by a macular transverse ray of the same color; a black oblong spot in the form of a transverse ray on the extremity of the discoidal cellule.

Upper side of female white, a little yellowish, with a marginal row of black triangular marks on the four wings, nearly touching, preceded by a sinuous row of sagittate spots, of which the concavity is turned inwards; the black spot of the discoidal cellule of the primaries is large, quadrangular, and a little prolonged on the upper edge.

Under side of the primaries differs from the upper in having the discoidal spot cut by a white vein; in having the summit of a pale yellow, with the marginal marks less distinct, paler, and each one divided by a whitish gray nervure.

Under side of secondaries pale yellow in both sexes, with the nervures whitish gray, slightly edged with blackish, a little dilated on the posterior edge; a transverse ray of six sagittate spots, blackish, corresponding to those on the upper side of the female; the upper edge, and two points at the base, saffron yellow; a vein of the same color, but paler in the discoidal cellule, and another not far from the abdominal edge, a little mingled; a small white space on the extremity of the discoidal cellule, and a small blackish, oblong spot, pupilled with whitish, situated between the costal and subcostal nervure.

Body whitish; head saffron yellow; antennæ black, annulated with white, with the club greenish white.

California—Chili.

3. **P. oleracea** *Harr.* Ins. Mass. (1842), 214.

All the wings white; base of the primaries dusky.

Under side of primaries yellowish at apex; nervures darkish.

Under side of secondaries straw color, with broad dusky nervures; base, deep yellow.

Body black; antennæ blackish, annulated with white; ochry at the end of the club.

Northern States.—Expands two inches.

HARRIS.

P. casta *Kirby.—P. cruciferarum* Boisd. Spec. Gen. 519. Figured in Kirby Faun. Bor. Amer., IV, pl. 3.

Antennæ black, annulated with white; wings white; primaries, at the anterior margin, sprinkled with blackish; secondaries, underneath, with a few scattered black scales accompanying the nervures; wings rounded and very entire.

KIRBY.

P. menapia *Felder.* Wiener Entom. Monatschrift, III, No. 9, 271.

Wings tender, white; veins black at the base; elongate; concolored; costal streak and apical edge black; this edge profoundly sinuate within, and divided on the under side with six (in the male five) large white spots.

Secondaries of the male with a submarginal streak, flexuous; blackish above, with black points situated at the extreme of the veins; below more distinct.

Secondaries of the female with the same streak, but much more distinct and obscure; below, the veins widely margined with fuscous; the costa, the basal and other spots a little livid; abdomen above blackish, below whitish.

Utah.

FELDER.

ANTHOCARIS Boisd.

Head rather small, short; eyes moderate, a little prominent; palpi rather long, somewhat divergent, bristled with stiff hairs, somewhat fasciculate; last article thin, very distinct, acicular, scarcely as long as the preceding; antennæ rather short, joints distinct, terminated more or less abruptly by an ovoid, compressed club. Abdomen not robust, a little shorter than the secondaries. Wings delicate, discoidal cellule closed; the secondaries lightly embracing the under part of the abdomen.

Larva slender, pubescent, attenuated at both extremities.

Chrysalis naked, navicular; rings immovable, carinated, more or less arcuated, destitute of lateral points; attached by the tail and a transverse line.

Anthocaris differs from *Pieris* in the form of the chrysalis, which is navicular, equally attenuated at both ends, and in the antennæ of the perfect insect. It can easily be distinguished from the allied genera by the delicate texture of the wings and the auroral or reddish spot which covers more or less of the summit of the primaries, at least of the males in two of our species.

1. **A. genutia** *Fab.* Ent. Syst. III, 1, 193. *Lherminieri* (fem.) Godt. *A. Midea?* Hübn.

Wings white; primaries, with external border concave, and the summit pale orange; upper edge near the base, sprinkled with grayish, a small black point near the middle.

The fringe of the secondaries bordered with a range of small black spots.

Under side of primaries white, with the summit greenish, small black point in the middle.

Under side of secondaries marbled with green.

Expands an inch and an eighth.

The female is destitute of the orange summit, but has blackish spots along that edge. The black spot on the middle of the primaries is larger than in the male.

Southern States.

Boisd.

2. A. lanceolata *Boisd.* Ann. Soc. ent. 2me sér. X, 284.

A little larger than *A. genutia*, but destitute of the auroral spot in the male as well as in the female.

Upper side white; primaries with a black spot at one end of the discoidal cellule, and at the other, some brownish black streaks.

Under side of primaries with the costal spot as above, and the summit reticulated with greenish gray.

Under side of secondaries entirely marbled and finely reticulated with greenish gray, with the edge marked with some small white spots, of which one is largest.

California—rare.

BOISD.

3. A. sara *Boisd.* Ann. Soc. ent. 2me sér. X, 285.

Upper side white, or white slightly tinted with yellow; that of the primaries marked at the summit with a large triangular orange red spot, bordered with black; the black spot of the discoidal cellule is connected with the black border.

Upper side of the secondaries transparently showing the markings of the opposite side, and with some blackish, marginal spots, more or less distinct.

Under side of primaries a little more pale than above.

Under side of secondaries finely pointed, and marbled with white and greenish, like *A. genutia*.

The females with a paler spot, not edged with black, and divided at the extremity by a series of sulphury white marginal points.

California.

BOISD.

NATHALIS BOISD.

Head rather large, bristled; palpi long, separate, extending beyond the eyes, covered with stiff hairs; second article long, the last much shorter than the preceding; antennæ very short, joints distinct, terminated abruptly by an oval, flattened club, a little truncated at the summit; body moderate. Abdomen as long as the secondaries. Wings not robust, discoidal cellule closed; the secondaries embrace a portion of the under side of the abdomen; the anterior border, in the male, with a small, oval, glandular, naked impression.

It differs from *Terias* by its long, separate, and bristly palpi; from *Anthocaris* and *Pieris*, by the shortness of the antennæ, and especially by the small glandular space mentioned above.

1. **N. iole** *Boisd.* Spec. Gén. I, 589.

Wings saffron yellow; the primaries have at the summit a black, rather large, triangular space, marked on the side with two small yellow streaks. Below this space, not far from the internal angle, a spot of the same color, surmounted by a small black point. Secondaries without spots, or with the border, with small, blackish, separate lines, nearly obsolete; the costal border blackish, marked with a lenticular space of dull gray, partly denuded.

The *under side* of the primaries differs from the upper, the ground color being paler, except along the side, where it is orange yellow; there is a small, discoidal, black point, and below the apical blackish space there are three blackish spots.

The *under side* of the secondaries is greenish yellow, strongly powdered with obscure atoms, especially towards the base, with two transverse obsolete lines, formed by the condensed atoms.

Body blackish, powdered with yellowish atoms; antennæ short, blackish, annulated with whitish, with the club much compressed, and of a russety tint. Expands one inch.

Texas.

Boisd.

2. **N. irene** *Fitch.*

"Differs from *N. iole* in having the under side of the primaries destitute of a blackish central dot, and of the three blackish spots towards their inner angle, the hindmost one is here prolonged into a broad stripe extending to the base of the wing, and slightly separated from its inner edge; and the base of the wing instead of its outer edge is orange yellow."

Mississippi Valley.

Fitch.

RHODOCERA Boisd.

Head small, retracted; eyes naked, not prominent; palpi much compressed, contiguous, furnished with short hairs, scaly; last article very short; antennæ rather short, *truncated, more or less*

arcuated, enlarging from the middle to the extremity; thorax rather robust, covered with fine silky hairs. Wings rather robust, discoidal cellule closed. The primaries always have the summit more or less sharp and angular; the secondaries sometimes furnished with a prominent angle, forming a groove, which embraces the lower part of the body; body shorter than the secondaries.

Larva feebly pubescent, attenuated at both extremities, green, with a paler lateral ray.

Chrysalis much arcuated, spindle-shaped at both ends; always attached by the tail, and a transverse line over the body.

Rhodocera strongly resembles the next genus, *Callidryas;* but it differs from that in the arcuated antennæ and angular wings. The ground color is yellow, more or less pale. Ordinarily, there is a ferruginous spot at the extremity of the cellule of each wing. The median nervure of the secondaries is more prominent than in the other genera. The males differ from the females in the more lively yellow of the wings. In the American species, the costal border of the primaries of the males is hispid, and rough to the touch.

1. **R. maerula** *Fab.* E. S. III, 1, 212. Figured in Cram. Pap. II, pl. 129. Hbst. Pap. pl. 103. Donov. Gen. illust. of Ent. pl. 2. Boisd. et Lec. 71, pl. 23. *R. eclipsis* Cram. Hbst.

Yellow citron above, with a black point on the middle of the primaries, and one of pale orange, slightly circled with black on the secondaries.

The *primaries* are somewhat falcate at the summit; along the outer border, a range of small orange points; secondaries, angular.

Under side paler than the upper; discoidal spot of each wing ferruginous, and marked with a white point.

Body of same color as the wings; antennæ reddish

Female, more lively yellow than male. Expands three and a half inches.

Southern States.

Boisd.

2. **R. lyside** *Godt.* Encyc. Méthod. IX, 93.

Upper side whitish green; primaries, with the base, yellowish orange, and the summit washed with yellow russety. Secondaries, without spots.

Under side of primaries a little paler than the upper, with the summit somewhat broader russety.

Under side of inferiors yellowish, without spots, the median nervure very prominent; antennæ short, grayish rosy, with the end of the club ferruginous.

Female whiter, with the upper side of the secondaries ochry yellow, and the base of the primaries deprived almost entirely of the yellow spot.

Southern States.

GODART.

3. **R. rhamni** *Linn.* Figured in Boisd. Spec. Gén. pl. 2, B. fig. 7.

Upper side of the male citron yellow, that of the female greenish white, with an orange point on the extremity of the discoidal cellule of each wing, and some very small indistinct ferruginous points on the fringe.

Under side of the male paler than the upper; the discoidal orange spot is replaced in both sexes by a ferruginous point, a little whitish in its centre.

Body blackish above, yellowish below, with white silky hairs on the thorax and at the base of the abdomen. Expands over two inches.

California.

BOISD.

CALLIDRYAS BOISD.

Inferior palpi much compressed, with short hairs; last article conical, much shorter than the preceding; antennæ of moderate length, neatly truncated at the extremity, slightly arcuated, enlarging insensibly from the base to the extremity. Prothorax rather long. Body robust. Abdomen much shorter than the secondaries. Wings robust, discoidal cellule closed; secondaries forming a groove which embraces the under side of the body.

The *Callidryas* vary in color from orange yellow to pale saffron. Their wings, *always destitute of angles*, ordinarily have on the

under side, at least in the females, one or two silvery or ferruginous points. They are distinguished from *Colias* and *Rhodoceras* by the absence of the rough costal edge of the primaries of the males, of the prominent angles, and by the form of the antennæ. The sexual difference is very striking, and this has led some writers to describe the two sexes as different species.

1. **C. eubule** *Linn.* Figured in Boisd. Spec. Gén. p'. 2, B. fig. 6. Cram. 120. A. B. 163. A. B. C. Boisd. et Lec. 74, pl. 24. Sm. Abb. I, pl. 5. *C. marcellina* Cram.

Boisd. in Boisd. et Lec. p. 75, following the example of the old authors, confounded this species with *C. marcellina*, making the latter the male; but a subsequent comparison of the *larvæ* convinced him of his error.

Male.—*Upper side* yellow citron, with a thin indistinct border of yellow, more dull and dentated on the primaries; the fringe of all the wings is marked by distant ferruginous small points.

Under side more deeply yellow; primaries, with two ferruginous, geminate points at the end of the discoidal cellule, followed by a transverse, brownish, zigzag ray.

Under side of secondaries, with two discoidal, silvery points, circled with ferruginous, situated on a sinuous, brownish line, preceded by red ferruginous points, more or less distinct, and followed by a tortuous, brownish, indistinct line.

Female, or *C. eubule* of authors, of a more vivid yellow; secondaries rounded, fringe orange, interrupted by transverse brown lines or spots. Primaries, with a large brown spot on the middle, cut by an orange arc; border narrow, brown, crenulate, preceded towards the summit by a tortuous, blackish, indistinct ray.

Under side more intensely yellow than the male, with the same markings more prominent and more ferruginous; the primaries have two discoidal, united silvery points; the secondaries have a part of the points of the base united in a tortuous line, so that they have three tortuous, transverse rays, of which the middle one is joined with that of the primaries.

Body yellowish, with greenish hairs on the thorax; antennæ, and under side of the last article of the palpi, rose brown. Expands about two and three quarter inches.

Florida.

BOISD.

2. C. marcellina *Fab.* E. S. III, 1, 209. Figured in Donov. Nat. Repos. pl. 6. Sm. Abb. I, pl. 5. Boisd. et Lec. pl. 24. *C. eubule* et *marcellina* Godt.

It is almost impossible to distinguish this species from *C. eubule.* The most positive character is, that the secondaries are less rounded, and the anal angle more prominent.

The *upper side* of the male is similar to that of *C. eubule;* but the under side has the points and tortuous lines more obsolete; the geminate ferruginous points of the primaries are replaced by a red or ferruginous point, cut by a small yellow nervure; and the two discoidal, silvery points of the secondaries, are a little smaller.

The *upper side* of the female has the same designs as *Eubule,* only that the secondaries have the posterior border very indistinctly marked by small brown lines or spots.

Under side similar to *C. eubule,* only that it is ordinarily strewed with small ferruginous atoms.

Larva deep citron yellow, punctured with black, and a blue transverse ray on each segment; abdomen below and feet yellow, with a lateral range of small blue lines above the feet. Feeds on *Cassia.*

Southern States.

Boisd.

COLIAS Fab.

Inferior palpi much compressed, covered with short silky hairs, rose red; *last article much shorter than the preceding;* antennæ straight, short, rose red, terminating in an obtuse cone, *which extends more than a fourth of their length.* Abdomen shorter than the secondaries; thorax robust; color more or less lively yellow; border black.

Colias differs from *Pieris* in the shorter antennæ, insensibly terminating in an obconical club; in the black border common to all the wings; in the primaries, usually having a black discoidal point, and the secondaries a central point, orange above and ordinarily silvery below, accompanied by another small point, in a small reddish or ferruginous spot on the insertion of the median nerve, at the base of secondaries below.

Larva smooth, slightly pubescent, a little attenuated at the extremities.

Chrysalis carinated above, not arcuate, destitute of lateral points, terminating anteriorly in a point; always attached by the tail, and a transversal line placed below the middle of the body.

1. **C. caesonia** *Godt.* Encyc. Méthod. IX, 98. Figured in Boisd. et Lec. 67, pl. 22. Stoll. Suppl. Cram. pl. 41. Lucas, Hist. Nat. des Pap. Exot. pl. 39. *C. philippa?* Fab.

Wings beautiful yellow; primaries, with the summit, very sharp, sometimes a little falcate.

Primaries blackish at the base, a large black point in the middle; a wide black border, sinuate, or rather emarginate interiorly, making the yellow part bear a rude resemblance to a dog's head, of which the black point forms the eye. On the upper edge, near the summit, are three whitish oblong streaks. Fringe rosy.

Secondaries with a black border strongly dentated within; two large geminate discoidal orange spots, and some streaks of the same color near the border. Fringe yellow, washed with rosy.

Under side of the primaries dull yellow, except in the middle; a black eye with a silvery pupil.

Under side of secondaries deep yellow, with two silvery, discoidal, geminate points, circled with ferruginous; besides this, a transverse line of ferruginous points, as in most of the species.

Body blackish above; yellowish below; antennæ reddish.

The *female* is of yellow, less bright; the border of the primaries is of black, less deep, with some indistinct yellow streaks; the border of the secondaries is interrupted, and the surface here and there presents some traces of rosy. Expands two inches and a half.

Larva green, with a lateral white band, punctured with yellow; besides this band, there is on each segment a transverse black band, bordered with yellow. Feeds on different species of *Trifolium.*

Southern States Boisd.

2. **C. edusa** *Fab.* Ent. System. Godt. Encyc. IX, 103. Figured in most of the European works on this subject.

Wings yellow, inclining to fulvous, more or less mingled with greenish on the secondaries.

The primaries have a large black point at the extremity of the discoidal cellule, and a wide border of the same color, sinuated interiorly, a little dilated at the summit, and divided at this part by *fine yellow nervures;* the secondaries have on the disk an orange spot, and at the extremity a black border following that on the primaries, more or less sinuated within, and terminating in a point a little before the anal angle.

Under side of the primaries differs from the upper in being a little more pale; all the part corresponding to the border is yellowish green, preceded by a transverse line of points, of which the three inferior are black, and the others ferruginous and smaller.

The *under side* of the secondaries is yellowish green, with two geminate, discoidal, silvery points, bordered with ferruginous corresponding to the orange spot, of which the outer is the smaller; besides this, there is a reddish line at the base, on the insertion of the median nerve; a small ferruginous spot on the costal edge, followed by a transverse line of ferruginous points in a line with those of the primaries.

The fringe of all the wings is yellow, interrupted with brown above and rosy below.

Body yellow greenish; back black; antennæ and feet rosy.

The *female* differs from the male in having the border divided by a yellow band, macular, interrupted on the primaries.

Larva, which feeds on *Trifolium*, is green, with a lateral ray mingled with white and yellow, marked with a fulvous point on each ring.

Chrysalis green, with a lateral yellow line and some ferruginous points.

Inhabits the four quarters of the globe.

BOISD.

3. **C. chrysotheme** *Hübn.* Pap. 426–8. Figured in Boisd. Spec. Gén. pl. 2, B. fig. 5. Boisd. Icones, pl. 9, fig. 34. Hübn. Europ. Schmett. pl. 85.

Resembles *C. edusa*, but paler; border browner, divided by fine yellow nervures. The primaries are broadly yellow on the edge; the discoidal point more narrow, transverse, surrounded with ferruginous. The discoidal spot on the under side of the primaries has a silvery pupil.

In the *female* the yellow orange occupies only the disk of the

primaries, and the yellow spots which divide the border are larger, more distinct, and paler.

Inhabits North America and Europe.

Boisd.

4. **C. philodice** *Godt.* Encyc. Méth. IX, 100. Figured in Boisd. et Lec. 64, pl. 21. Swains. Zool. Illust. 1st series, pl. 60. Lucas, Hist. Nat. des Pap. Exot. pl. 39. *C. anthyale* Hübn.

Upper side canary yellow, with a black border, slightly sinuous within, and terminating on the secondaries, a little before the anal angle. *Primaries*, with a black point near the upper edge. *Secondaries*, with a pale orange point on the disk.

Under side of primaries canary yellow, with the edge and extremity a little russety; the discoidal point usually pupilled with white.

The *under side* of the secondaries is yellow, a little russety, with two geminate, discoidal, silvery points, bordered with ferruginous, of which the outer one is the smaller; parallel to the outer edge of both wings there is a series of ferruginous points.

The fringe of the four wings is rosy below; more dull above.

Body and antennæ as in the other species.

The *female* has the border less black, a little wider, a little dilated at the summit, divided on the primaries by a macular band interrupted by the ground color; the discoidal point pupilled with whitish above.

A female variety is sometimes found with wings nearly white.

Inhabits the United States.

Boisd.

5. **C. amphidusa** *Boisd.* Ann. Soc. Ent. 2me sér. X, 286.

Wings with the border of the same form and width as *edusa;* slightly powdered with yellowish atoms, and divided at the summit of the primaries by three or four fine yellow nerves. The upper edge slightly powdered with citron yellow.

Female, sulphury white.

California.

Boisd.

6. **C. eurytheme** *Boisd.* Ann. Soc. Ent. 2me sér. X.

Perhaps only a variety of *C. chrysotheme.*

Usually much larger, of a brighter orange fulvous, with the yellow nervures less numerous. The spots which divide the border

of the secondaries in the females are less neat and less distinct than in *C. chrysotheme*.

California, Mexico, and some of the States.

Boisd.

7. **C. pelidne** *Boisd.* Boisd. et Lec. 66, pl. 21.

Upper side of all the wings yellow, inclining a little to greenish, with a black border, regularly sinuated on the internal side, and ending on the secondaries towards the middle of their outward seam.

Under side of the primaries is paler, with the edge powdered with darker atoms, and an oval, central, elongated point, pupilled with reddish.

Under side of the secondaries is greenish yellow, with a rounded, central, reddish point, surmounted by another much smaller point of the same color. The base also has a reddish point.

The fringe of all the wings is red; antennæ yellowish rosy, with the knob brownish above and yellowish below.

Labrador.

Boisd.

8. **C. phicomone** *Godt.* Encyc. Méthod. IX, 100.

Upper side greenish yellow in the male; greenish white in the female, covered in both sexes with a blackish powder, usually less abundant in the disk of the primaries, marked with a black discoidal point; a rather wide blackish border, and divided by a range of spots of the ground color. *Secondaries* have also a black border, divided by a band of the ground color; but the black often disappears, especially in the female, so that the border is formed by a yellow or whitish band; a discoidal yellow spot.

Under side of the primaries white, more or less greenish, with the summit russety yellow; a silver discoidal point, bordered with ferruginous, sometimes united to a smaller point; a small ferruginous spot on the insertion of the median nervure and the costal edge.

Labrador.

Boisd.

9. **C. nastes** *Boisd.* Spec. Gén. I, 648.

Smaller than *C. phicomone*, but very similar to it.

Under side yellow, a little greenish, powdered as in *phicomone*, with the fringe and the edge of the primaries a little more rosy;

primaries with a blackish border, insensibly mingling with the yellow, divided by small elliptical yellow spots, placed on the nervures; a black discoidal point, sometimes ocellated. Secondaries nearly like *phicomone*.

Under side of the primaries white, more or less greenish, with the summit yellowish, and a black discoidal point, pupilled with whitish.

Under side of the secondaries greenish yellow, covered with a fine blackish dust from the base to beyond the middle, and marked at the extremity of the discoidal cellule with a solitary small spot of a ferruginous reddish, pupilled with russety white. Antennæ red, with the under side of the club yellow.

Female whitish above, less powdered with blackish atoms than the female of *C. phicomone*, with the border of the primaries divided by regular elliptical spots.

Labrador.

Boisd.

10. **C. hyale** *Linn.* Figured in Fischer Entom. de la Russie, pl. 11. *C. palaeno* Fisch.

Upper side saffron yellow, with a large black point at the end of the discoidal cellule of the primaries, and a pale orange spot, a little bilobed, on the disk of the secondaries. Primaries with a black border at the extremity, widened at the summit; cut its whole length by a suite of spots of the ground color, of which the two intermediary are less distinct, and the following ones sometimes mingled with the general tint. Secondaries with a blackish border, narrow, often macular, and sometimes nearly obsolete, especially in the males.

Under side of the primaries has no border, summit yellow, a little russety, preceded by a transverse line of blackish points.

Under side of secondaries entirely russety yellow, with two geminate points, discoidal, silvery, bordered with ferruginous, corresponding to the orange spot of the upper side, of which the exterior is the smallest; besides this, a small reddish mark at the base, a small ferruginous spot on the costal edge, followed by a transverse line of ferruginous points, on a line with those of the primaries. Fringe reddish, as well as the upper edge.

Body yellow, with the head ferruginous; palpi, antennæ, and feet reddish.

Female pale saffron yellow, and nearly white above.
California—Europe—Africa—Siberia.

Boisd.

11. **C. vosnesenski** *Ménétriés.* Figured in Cat. Petersburg Imper. Acad. Sci. 77.

Nearly the size of *C. caesonia;* but the primaries are much more pointed at the summit, and the external edge more falcate.

The primaries have a beautiful, vivid, yellow spot on the disk; a violet reflection over all the wing; base powdered with black, as well as the whole length of the anterior edge; a black discoidal point; the black border of the external edge is wider than in *C. caesonia;* it is emarginated, square, somewhat, as in this species, but it encroaches more on the yellow spot so as to nearly touch the discoidal point, which completely destroys the likeness to a dog's head, so distinctly marked in *C. caesonia.*

The fringe is rosy, with some yellow spots on each side of the summit.

The secondaries are beautiful citron yellow, covered over with orange yellow without any spot, only that the trace of the discoidal point of the under side is indicated by an orange point.

The *under side* of the four wings as in *C. caesonia*, only that the discoidal point of the primaries is smaller, and the second silver point of the secondaries is larger. Head black; antennæ reddish; thorax black, with some scattered yellow hairs.

Body black, a little yellowish below.
California.

Ménétriés.

TERIAS Swains.

Head short, inclined, somewhat concealed under the costal edge of the primaries; eyes naked; palpi very short, covered with short hairs, scaly; last article small, thin, naked, much shorter than the preceding; antennæ slender, articulation distinct, terminating in an *ovoid* or conic club, a little arcuate, slightly compressed laterally.

Body rather slender; prothorax very short. Abdomen compressed, extending the length of the secondaries. Wings thin,

delicate, rather wide, discoidal cellules closed; primaries having the costal edge strongly arcuate towards the base; the secondaries embracing the abdomen below.

This genus has been sometimes confounded with *Pieris* and again with *Colias*. It differs from the first in having the palpi furnished with shorter and more closely set hairs, and the last article very short. It differs from the second in the delicate texture, the arcuate antennæ, the laterally compressed club, and the wings destitute of the discoidal silvery spots below.

The thin and delicate wings are usually yellow, with the summit of the primaries deep black, contrasting agreeably with the ground color.

1. **T. nicippe** *Fab.* Ent. Syst. III, 1, 208. Figured in Cram. Pap. pl. 210. Herbst. Pap. pl. 107. Boisd. et Lec. 55, pl. 20. Say's Amer. Ent. pl. 30. Lucas' Hist. Nat. des Pap. Exot. pl. 38.

Upper side lively yellow orange, with a wide black common border, sinuate within, wider at the summit of the primaries, where it is surmounted on the upper edge with three or four small yellow streaks. The primaries also have on the extremity of the discoidal cellule a small black crescent, and the upper edge towards the base is densely sprinkled with black.

Under side of primaries paler.

Under side of secondaries yellow, with brown atoms; a small discoidal black dot; a brownish spot on the middle of the costal edge; then a transverse band, undulate, more or less brownish.

Female differs from the male in being paler and often of a yellow color; *the black border of the primaries suddenly ceases a little before the internal angle*, and that on the secondaries is partly effaced towards the anal angle.

Larva, which feeds on *Cassia* and *Trifolium*, is pale green, with a dorsal ray more obscure, and a lateral white band, marked before with five yellow points.

Chrysalis green, a little arcuate, sprinkled with ferruginous spots.

United States.—Expands a little over two inches.

Boisd.

2. **T. lisa** *Boisd.* Boisd. Spec. Gén. I, 661. Figured in Boisd. et Lec. 53, pl. 19. Boisd. Spec. Gen. pl. 2. *T. smilax* Godt.

Wings citron yellow above. *Primaries* have the base powdered with blackish; a small black discoidal point; a black border, beginning at the middle of the upper edge, dilated at the summit, and dentated within the whole length.

Secondaries have a narrow black border, dentated within, obsolete towards the anal angle.

Fringe of all the wings rosy above.

Under side of primaries yellow, with a small black discoidal point, and the upper edge embroidered with reddish.

Under side of secondaries yellow, sprinkled with obscure atoms, with three small blackish points, of which one is on the base, and two on the disk; a blackish, undulate, transverse, macular ray, followed on the external angle by a roundish, ferruginous spot.

The four wings are edged with red ferruginous, interrupted by small black points, and separated from the fringe by a thin line of silver white.

Female pale saffron yellow, with the base of the superiors more densely powdered with blackish.

Larva, which feeds on *Cassia* and *Glycina*, is green, with four longitudinal whitish rays.

Chrysalis green.

Southern States.—Expands nearly two inches.

Boisd.

3. **T. delia** *Cram.* Figured in Cram. Pap. Exot. pl. 273. Herbst. pl. 17. Boisd. et Lec. pl. 18. *T. daira* Godt.

Primaries citron yellow, with a wide black border, dentated within, ending abruptly before reaching the internal angle. Upper edge sprinkled with blackish; a blackish *longitudinal* band, rather wide, *parallel to the internal edge*, bordered with marigold below, and not extending to the internal angle.

Secondaries yellow; a black, marginal, triangular spot on the outer angle, in a line with some small, indistinct, marginal points or streaks of the same color, situated on the extremity of the nervures.

Fringe of all the wings above rosy.

Under side of primaries yellow, with the edge and summit wine red, and two small black discoidal points.

Under side of secondaries wine red, two small blackish discoidal points, and a transverse, undulate, brownish, interrupted band.

The *female* is destitute, or nearly so, of the black longitudinal band, and of the marginal, marigold line. The base is sprinkled with blackish.

Larva, which feeds on *Trifolium*, *Cassia*, and *Glycine*, is green, with a longitudinal white line on each side above the feet.

Chrysalis green.

Southern States.—Expands an inch and a half.

BOISD.

4. **T. jucunda** *Boisd.* Boisd. Spec. Gén. 1, 665. Figured in Boisd. et Lec. pl. 19.

Primaries like those of *T. delia*, except that the fringe is white, and the ground color of a less lively yellow.

Secondaries yellow saffron, with a blackish border, a little sinuated within, and nearly obsolete before reaching the anal angle.

Under side of primaries yellow in the middle; other parts whitish, sprinkled with grayish atoms.

Under side of secondaries white, finely aspersed with grayish.

Female paler; primaries densely powdered with blackish, destitute of the marigold line; border of secondaries a little wider, and sometimes interrupted by yellow streaks.

N. America.—Expands about an inch.

BOISD.

T. proterpia *Boisd.* Boisd. Spec. Gén. 654. Figured in Lucas' Hist. Nat. des Pap. Exot. pl. 38.

Upper side orange red in the male, and russety yellow ochre in most of the females; nervures black towards the extremity. *Primaries*, with a black border along the upper edge, rather wide, continuing more or less on the outer edge. *Secondaries* without a border, or with a blackish border effaced; outer edge angular in the middle.

Under side of all the wings paler than on the upper; that of the primaries without border or spots, that of the secondaries more or less sprinkled on the disk with spots or atoms a little more obscure, sometimes nearly obsolete.

The nervures of the ground color, or only those of the primaries blackish at the extremity. *Secondaries* without any border, with the exterior angle much more prominent and prolonged, in the form of a tail.

Under side of secondaries more densely sprinkled or speckled with atoms and ferruginous spots.

Texas—Mexico.—Expands 18 to 22 French lines.

BOISD.

T. mexicana *Boisd.* Boisd. Spec. Gén. 679. Figured on pl. 3, C. fig. 1, of Boisd. Spec. Gén.

Wings brilliant citron yellow; primaries with a black border at the extremity, rather wide, ending squarely at the internal angle, showing near the middle a rather deep quadrangular sinus; the outer edge slightly sinuate, and whitish; secondaries, with the middle of the exterior edge prolonged to a prominent angle, in the form of a tail; a black border of moderate width, a little dentated on its internal side, not reaching the internal angle; costal edge washed with orange yellow, mingling with the ground color.

Under side of the primaries pale citron yellow, with a black central point, the edge intersected with brown points; the outer edge reddish near the fringe.

Under side of secondaries yellow, sprinkled with ferruginous atoms, with a blackish central point; edge intersected with ferruginous points, and marked near the external angle with a spot of the same color; the posterior half having four or five other spots of the same color, of which two or three are in a line, and tending to form a transverse band; the middle of the outer edge more or less washed with ferruginous.

Female differs from the male in the upper side being yellowish white, with a wider border, the quadrangular sinus more profound; the anterior edge of the secondaries widely orange yellow, and below, three ferruginous posterior spots form on the secondaries a narrow, transverse, ferruginous band.

Texas—Louisiana—Mexico.

BOISD.

FAM. III. DANAIDAE.

Larva smooth, cylindric, with five pairs of simple, fleshy, flexible processes. *Chrysalis* rather short, cylindric, with brilliant golden spots. *Perfect insect;* palpi separated; thorax and pectus with spots. Wings wide, discoidal cellule closed. Hooks of the tarsi simple.

DANAIS Boisd.

Head a little more narrow than the thorax; antennæ rather long, insensibly terminating in a club; palpi remote, with the last article short, acicular, and straight; white points on the head, prothorax, thorax, and breast. Abdomen rather thin, nearly as long as the secondaries. Wings wide, with the outer edge somewhat sinuate. Secondaries of the males have usually, towards the anal angle, a very black spot or tubercle, divided by a grayish ray in relief, placed on the extremity of the nervure.

Our two species have two ranges of whitish points on the blackish border of the wings.

1. **D. berenice** *Cram.* Figured in Cram. Pap. pl. 205. Sm. Abb. vol. I, pl. 7. Boisd. et Lec. pl. 39. *D. erippus* Godt. Fab. *D. gilippus* Sm. Abb. Godt.

Wings rufous brown, often more obscure at the base, with a black border extending from the upper edge of the primaries to the anal angle of the secondaries.

The *primaries* have on both sides a number of white spots on the upper edge and disk, forming usually two marginal ranges, of which the outer divides the border.

The *secondaries* have sometimes the black border without any points, and sometimes it is divided by one or even two ranges of white points.

The *under side* of the primaries differs very little from the upper; but the under side of the inferiors is divided by wide black veins, bordered with whitish. The disk has three or four white points, situated on the edge of the discoidal cellule. The black marginal border is divided by two rows of white points.

The nervures on the upper surface of the secondaries in the female are finely lined with grayish white.

The *larva*, which feeds on *Nerium*, *Asclepias*, &c., is whitish violet, with transverse stripes of a deeper color; a transverse band of reddish brown, on each ring, divided in its length by a narrow yellow band. Along the feet a longitudinal band of yellow citron. Long, fleshy processes, of brown purple, disposed in pairs on the second, fifth, and eleventh rings.

Chrysalis green, with golden points on the anterior side, and a

semicircle of the same color on the dorsal side, a little beyond the middle, separated from a blue band by a row of small black dots.

Southern States.—Expands three and three quarter inches.

Boisd.

2. **D. archippus** *Sm. Abb.* Figured in Sm. Abb. vol. I, pl. 6. Cram. 206. Hübn. Exot. Samml. Say's Amer. Ent. III, pl. 54. Boisd. et Lec. 137, pl. 40. *D. megalippe* Hübn.

The four wings somewhat sinuate, fulvous above, with a rather brilliant reflection; all the wings entirely margined with deep black, having, in fresh specimens, a bluish reflection; nervures same color. The summit of the primaries has three oblong, fulvous spots, preceded by eight or ten smaller, white or yellowish white extending to the middle of the upper edge. Two rows of white spots on the outer borders of all the wings; occasionally the inner row is ferruginous. The fourth nervure of the secondaries has a large black spot or tubercle.

The *under side* presents the same markings as the upper, but the points of the posterior edge are larger and all white. The ground color of the secondaries is nankin yellow, with the nervures slightly bordered with whitish. The emarginations of all the wings white.

Body black, with yellowish points on the thorax and breast.

The *female* has wider nervures, and is destitute of the black tuberculous spot on the secondaries.

Larva whitish, transversely fasciated with black and yellow. It has two pairs of fleshy processes, blackish, of which the anterior pair are situated on the second ring, which are much longer than the other pair, situated on the eleventh ring. Feeds on *Asclepias.*

Chrysalis pale green, with golden points before; a semicircle of gold behind, bordered below by a range of small black dots.

Middle and Southern States.—Expands four and a half inches.

Boisd.

Fam. IV. HELICONIDAE.

Larva cylindric, spinose the whole length. *Perfect insect;* palpi short, separate, not much elevated. Abdomen thin, elongate. Wings oblong, narrow, elongate. Abdominal edge of the secondaries scarcely embracing the under side of the abdomen. Discoidal cellule closed.

HELICONIA Fab.

Palpi extending a little beyond the clypeus; second article much longer than the first; antennæ filiform, gradually enlarging towards the extremity. Wings *oblong, narrow*. Abdomen elongate; four walking feet in both sexes.

1. **H. charitonia** *Linn.* Linn. Syst. Nat. II, 757. Figured in Cram. pl. 191. Boisd. et Lec. 140, pl. 41. Lucas' Hist. Nat. des Pap. Exot. pl. 50.

Wings black, with bands of citron yellow. The *primaries* have three, of which the two outer are transverse and oblique; the inner one proceeds directly from the base to the middle, where it makes an elbow to gain the posterior edge above the internal angle.

The *secondaries* have two transverse bands, of which the upper is the wider, straight and continuous; the lower is curved, and formed of spots of different sizes. The posterior edge, which is slightly sinuate, has, towards the anal angle, a range of six or seven small yellow points, and near the base there are one or two points of carmine.

The *under side* resembles the upper, except that the yellow bands are paler; the primaries have the upper edge reddish at the base; the secondaries have four blood red points, disposed two by two near the abdominal edge, and separated by the upper band; and, finally, the marginal points of these secondaries are whitish, and extend to the summit.

Body black, with yellow points on the head and thorax, and lines of the same color on the sides of the breast and abdomen.

Georgia and Florida.—Expands three inches and a half.

Boisd.

2. **H. diaphana** *Drury.* (Westwood's Ed.) Figured in Jardine's Nat. Libr. vol. IV, pl. 12, fig. 3. Drury, vol. II, pl. 7.

Upper side: antennæ black and very long; thorax and abdomen dark brown.

Wings transparent, vitreous. *Primaries* with the anterior edges bending inwards. A small narrow border of dark brown runs entirely round the edges of these wings, and on the anterior edges about a third from the tips, runs a dark brown streak towards the middle of the wings, close to which is a small white spot, joining

to the anterior edge. *Secondaries* having also a very narrow border, running about two-thirds round them, and stopping at the abdominal edges. Some long yellowish hairs are placed on the anterior edges near the body.

Under side: palpi, sides, breast, ash colored. The dark brown borders surrounding the wings appear on this side orange brown; the rest as on the upper side; margins of the wings entire.

Texas.

Westwood's Drury.

Fam. V. NYMPHALIDAE.

Larva cylindric, spinose the whole length, or only on the head. *Chrysalis* variable. *Perfect insect;* palpi usually close, elevated, very scaly; the anterior face of their first two articles nearly as wide or wider than their sides. Abdominal edge of the secondaries forming a deep groove to receive the abdomen. Discoidal cellule nearly always open. Hooks of the tarsi bifid.

ACRAULIS Boisd.

Head large, at least as wide as the thorax; antennæ rather long, terminated by a flattened club, more elongate, and less rounded than in *Argynnis;* palpi ascending, a little divergent at the summit, covered with close-set hairs; the first article very short, obtuse. Abdomen shorter than the secondaries; discoidal cellule of the latter always open; primaries elongate, with the posterior edge sinnate; the secondaries denticulate.

1. **A. vanillae** *Linn.* Linn. Syst. Nat. II, 787. Figured in Cram. pl. 212. Stoll. Suppl. pl. 1. Sulz. Gesch. pl. 18. Clerck, Icon. pl. 40. Boisd. et Lec. 143, pl. 42. *A. passiflorae* Fab.

Male, bright fulvous; female, more dull; primaries elongate, posterior border a little concave, divided at the summit by the veins, and lower down by streaks, widest at the edge, black. Disk, with some black spots, of which two or three of those situated in the discoidal cellule are pupilled with white. In some specimens, these pupils are obsolete.

The *secondaries* are bordered by a black band, crenated on the outside, and divided by large spots of the ground color. Between the centre and outer edge there are three or four black spots.

The *under side* of the primaries differs from the upper in having the summit dull yellow (the color of dead leaves), with six or seven silver spots, and the costal spots pupilled with silver.

The *under side* of the secondaries is dull yellow, with about seventy-two very brilliant silver spots, elongate, of which the marginal are smaller. The upper edge at the base is also silvery. Among the spots in the middle, one is strongly emarginate, or nearly separated in two.

Body fulvous above, yellowish below, with white dots on the head, and silvery lines on the breast.

Larva cylindric, pale, fulvous, with four blackish longitudinal bands, of which the two dorsal are sometimes obsolete; furnished with ranges of blackish ramose spines, of which two are placed on the summit of the head. Head with a whitish ray on each side, lined with black; feet black.

Chrysalis russety brown, with some paler shades. Feeds on *Passiflora*.

Southern States.—Expands four inches.

Boisd.

ARGYNNIS Fab.

Head large, at least as wide as the thorax; antennæ rather long, abruptly terminated by a flattened club, *grooved;* palpi pilose, somewhat remote; the first article slender, naked at its extremity, and pointed like a needle. Abdomen shorter than the secondaries. Wings sinuate or denticulate.

Ground color fulvous, usually with black points, forming sinuous, transverse lines, and sometimes with a blackish border, more or less wide; the under side usually has nacred spots, or violet or ferruginous nacred reflections.

1. **A. idalia** *Fab.* Fab. Ent. emend. III, 145. Figured in Cram. pl. 44. Drury I, pl. 13. Herbst. pl. 252. Boisd. et Lec. 147, pl. 43. Lucas' Hist. Nat. des Pap. Exot. pl. 56.

Upper side of primaries fulvous, with about fifteen black spots, of which the upper are linear, situated in the discoidal cellule; below these they form a zigzag, transverse line; the others are round, smaller, and disposed in a line parallel to the outer edge: this edge is covered by a wide black band, dentated within, and

divided, in the male, by a range of yellowish crescents; and in the female, by a row of white spots.

The *female* has also some white spots on the summit, where the border dilates considerably.

The *upper side* of the secondaries is steel blue, with the base russety, traversed by two rows of large white points, of which the outer are yellow in the male.

The *under side* of the primaries resembles the upper, except that the terminal band is less deep, and the spots which divide it are nacre.

The *under side* of the secondaries is dull brown (dead leaves), with about twenty-eight nacred spots, of which the seven marginal are crescents; those of the disk are conic, divided or bordered by a black line; the edge at the base nacre. Emarginations of the wings whitish.

Body blackish, with yellow hairs on the thorax.

United States.—Expands nearly five inches.

Boisd.

2. **A. diana** *Cram.* Cram. II, 4. Figured in Cram. pl. 98. Herbst. pl. 253. Say's Amer. Ent. pl. 17.

Wings slightly dentate; black brown from the base to the middle, then fulvous to the edge. The fulvous forms a wide band, crenate within, having on the primaries two transverse rows of black points, and on the secondaries only one row.

The black points are obsolete on the *under side* of the primaries; the dark part is marked with two nacre spots, preceded within by three fulvous streaks, and outwardly by three small yellowish spots.

Under side of secondaries much paler than the upper, with nine nacre spots, of which three are triangular, situated between the base and the middle of the outer edge; the seven others are crescent, on a line with the posterior edge.

Southern States.

Say.

3. **A. cybele** *Godt.* Godt. Encyc. Méthod. IX, 263. Figured in Cram. pl. 57. Herbst. pl. 255. Boisd. et Lec. 151, pl. 45. *A. daphnis* Cram. *A. aphrodite* Fab.

Upper side obscure from the base to the middle; deeper in the female; then fulvous, with three transverse rows of black spots, of which the interior are in a zigzag line. Those intermediary are

round; the exterior crescent. In the discoidal cellule there are some marks as in the analogous species. The outer edge is preceded by a black line crossed by nervures of the same color.

Under side of the primaries like the upper, except that the base is fulvous; and opposite the summit there are some silvery spots, of which four or five rest on the black crescents.

Under side of the secondaries brown ferruginous, with the base and about twenty-four spots, nacre; the spots at the base are small; those of the middle larger; those of the edge triangular, and separated from the preceding by a yellowish band, losing itself in the ferruginous.

Body brownish; antennæ blackish; club black, tipped with fulvous.

This species is usually confounded with *A. aphrodite*, but is different, as will be seen from the description.

United States.—Expands nearly three inches.

Boisd.

4. **A. aphrodite** *Fab.* Fab. Syst. Ent. III, 1, 144. Similar to *A. cybele*, for which it is usually taken.

Primaries tawny orange brown at base, spotted, inscribed and reticulated with black; at the posterior margin, a deep orange band, edged with black; above this, a series of black crescents, succeeded by one of round spots; the costal margin is barred with black, the three anterior bars being angular, and the fourth shaped like the letter P; this is followed by three others less distinct; the reticulations of the disk terminate posteriorly in a zigzag black band; underneath, at the external angle, are five silver marginal series of crescents, above which the wing is spotted with black, with a few paler spots surmounted by a black crescent; underneath they are reddish brown, with a pale, tawny, marginal band. A marginal series, consisting of seven silver triangular spots, edged with black, next follows; and a second series, consisting of the same number, differing in shape, edged also with black, the intermediate one being the smallest; a third series of four spots succeeds, that next the costal margin is crescent-shaped; the second is subtriangular, divided by a black line; the third is oblong; the fourth minute. At the base are five spots, varying in form; on the shoulders is also a silver spot, and the inner margin is silvered, but less conspiculously. Fringe pale, barred with black.

Fabricius does not mention the two costal silver spots of the

prone surface of the primaries. In some specimens these appear not silvered.

United States—Canada.—Expands $2\frac{1}{4}$ to $2\frac{1}{2}$ inches.

KIRBY.

Doubleday, in *lit.*, says: "*A. aphrodite* is smaller and rather brighter than *A. cybele*. It has the outer margin of the primaries quite black, instead of the fulvous markings of *A. cybele*. The margins of the secondaries have an additional black line; flight also different."

5. **A. columbina** *Godt.* Godt. Encyc. Méthod. IX. Figured in Cram. pl. 209 et 69. Boisd. et Lec. 153, pl. 41. *A. hegesia* Cram. *A. claudia* Cram.

Wings bright fulvous above, paler in the female, with a transverse, posterior row of black points; outer edge black, divided by a range of fulvous crescents; the four wings are traversed by two black zigzag lines.

The *primaries* have, besides, two annular black spots on the discoidal cellule.

The *under side* of the primaries has the upper edge fulvous; the second zigzag line is obsolete, and at the summit there is a grayish triangular space more or less distinct.

Under side of secondaries yellow russety, tainted with brownish; two whitish transverse bands, of which the anterior is discoidal, extending somewhat on the nerves; the second is marginal, narrow, dentated within, separated from the first by a row of black spots pupilled with grayish.

Body of same color as the wings.

This species varies much according to localities. There are some on which the second zigzag ray is obsolete; others, on which the first is apparent only in the primaries; others again, which show scarcely any trace of the whitish transverse on the under side of the secondaries.

Larva spiny, reddish yellow, with two lateral bands, and a series of dorsal spots, white; abdomen whitish, with the head and feet black; spines blackish, and the two on the first ring are much larger, and directed towards the front like antennæ.

Chrysalis white, moderately angular, scattered with black dots and streaks; dorsal points yellow.

Southern States.—Expands three inches.

BOISD.

6. **A. myrina** *Cram.* Cram. Encyc. Méthod. IX, 268. Figured in Cram. pl. 189. Herbst. pl. 255. Boisd. et Lec. 155, pl. 45. Say's Amer. Ent. pl. 46. *A. myrissa* Godt.

Upper side fulvous with black spots, some irregular, disposed confusedly towards the base; the others are in the form of points or dots, in a line parallel with the outer edge, which has a black band, divided by a series of fulvous crescents.

Under side of primaries paler, except at the summit, where it is a little ferruginous, and marked with two or three nacre spots. The outer edge also has a range of triangular silver lunules.

The *under side* of the secondaries is red ferruginous, with two or three yellow spaces, and about twenty-four silver spots, some irregular and unequal towards the base, the others disposed in two transverse series, of which the one forms marginal crescents; these two rows are separated by a series of brownish black points. Towards the base of the wings there is a black silvery circle.

Body blackish above, grayish yellow below; antennæ black, and annulated with white, and the extremity of the club yellow.

Female with a taint a little less vivid than the male.

United States.—Expands one and three quarter inches.

Boisd.

7. **A. bellona** *Godt.* Godt. Encyc. Méthod. IX, 271. Boisd. et Lec. 164, pl. 45.

Size and form of *A. myrina*, but the primaries are a little more sinuous.

Wings fulvous, with a large number of black spots, some placed confusedly towards the base, where the ground color is more obscure, the others forming two parallel rows on the outer edge, which is sometimes a little intersected with black.

Under side of primaries fulvous and spotted, as above, with the summit washed with brown and pale yellow, and marked with a small transverse line of whitish violet.

The anterior half of the *under side* of the secondaries is yellow russety, with ferruginous undulations and atoms, a bifid spot of whitish violet towards the base, inclosing in its angle an orbicular spot of reddish yellow. The other half is violet or coppery purple, with a transverse row of six or seven brown points pupilled with whitish, followed on the terminal edge with obscure lunules, more or less distinct, and forming nearly a continuous marginal ray.

Body and antennæ as in the analogous species.

Southern States.—Expands an inch and a half.

Boisd.

8. **A. freya** *Godt.* Godt. Encyc. Méthod. IX, 273. Figured in Herbst. pl. 272.

Stalk of the antennæ yellow, with a large compressed brown knob, red underneath, at the base and tip.

Wings tawny, dark brown at the base, with a narrow black band occupying the posterior margin, followed by a series of black arrow-headed spots, next to which in the primaries is a zigzag, angular, discoidal, black band, and at the anterior margin, five transverse spots of the same color.

The *under side* of the primaries is tawny, variegated with black and white spots and lines.

Under side of the secondaries is reddish, variegated with white and yellow spots and band, with a discoidal, arrow-headed, white spot in the centre. Fringe of the wings alternately white and yellow.

Canada.

Kirby, Faun. Bor. 391.

9. **A. aglaia** *Linn.* Syst. Nat. II. Figured by many European authors.

Reddish yellow with black marks.

Under side of the secondaries greenish, yellow near the seam; no reddish spots with silver pupils; the nacred spots usually small and round, in number about twenty-one, not including those at the origin of the upper edge and internal edge, which are also silvery.

In the *females*, the marginal lunules of the upper side of the primaries are yellow, not fulvous.

California and Europe.

Godart.

10. **A. calippe** *Boisd.* Boisd. Ann. Soc. Ent. 2me sér. X, 302.

Upper side fulvous, traversed by a black zigzag ray, preceded from the side of the base by black sinuous streaks, and followed by a row of black points; all the exterior contour blackish, divided by a line of lunules more pale than the ground color.

Under side of primaries reddish fulvous, paler at the extremity, with the same markings as above, and a series of silvery marginal lunules, preceded by two or three apical spots of the same color.

Under side of secondaries brownish, with about twenty silver spots, the edge of the wings towards the abdomen silvery.

In the *female* the ground color is paler, with the other markings blacker; on the under side the general tint is paler, and nearly yellowish.

California—rare.

Boisd.

11. **A. ashtaroth** *Fisher*. Figured in Proceed. A. N. S., Phila., 1858, p. 180, pl. 8. In the place cited, this species is named *astarte*, but was afterwards changed to *ashtaroth* by Dr. Fisher.

Upper wings with both surfaces fulvous; above with a broad, black exterior margin, containing a range of seven small whitish spots, parallel with the margin; four large oblong spots of black proceeding from the exterior margin, the two intermediate ones reaching beyond the middle of the wing, the others shorter, with each a small fulvous spot near the tip; and four spots of black descending from the subcostal nervure, of which the one nearest the body is linear, the next square, the third roundish, with a fulvous spot in the centre, and the fourth connate with the fourth of the before-mentioned spots proceeding from the exterior margin.

The *lower wings* are above bluish black, changing to brownish fulvous near the base, with an indistinct whitish spot below the centre.

The *under side* of the upper wings has seven spots of pearly white parallel with the outer margin, of which the five exterior ones are linear, and the two others round; from these two round spots proceed two oblong black spots to the middle of the wing, and the two next have each a round black spot above them. From the subcostal nervure proceed four black spots, of which the two nearest the body are linear, the next triangular, inclosing a fulvous spot, and the fourth is almost confounded with the black upper margin.

The *under side* of the lower wings is brown, with four white sublunate spots, bounded above and below by black, and parallel with the lower margin. There are, likewise, two long black spots outside of the outer one of these spots; the whole base of the wing is occupied by six large pearly spots, radiating from the axilla, one of which occupies the precostal portion; between the second and third (which are very wide) is a smaller spot, and the third is

crossed near its base by a short black bar. The emarginations of the wings are margined with white.

Body black; thorax thickly covered with brownish fulvous hairs.

The above described butterfly so nearly resembles the *Argynnis idalia*, that at first sight it may easily be taken for a mere variety. The want of a double row of white spots on the upper surface of the lower wings, although a remarkable difference, would not perhaps constitute a specific mark; yet, when we come to examine the under surface, instead of the twenty-four or twenty-five spots of white, which are observed over its whole surface, we find but two near the margin, and six large ones occupying nearly the whole of the base, and radiating from the axilla, we cannot hesitate to pronounce it distinct and certainly new.

The *larva* is unknown. The interesting fact of so large a species of butterfly being found at this time in New Jersey, and having heretofore escaped the researches of all entomologists, has led me to offer this short communication for publication in the Proceedings. It was found by me in July of this summer, on Succasunna Plains, near Schooley's Mountain, in Morris County.

FISHER.

Most probably a variety of *A. idalia*. (Morris.)

12. **A. ossianus** *Herbst.* Boisd. et Lec. p. 157. Figured in Boisd. Icon. Hist. pl. 19. Herbst. pl. 270. *A. trichlaris* Hübn.

Small; *upper side* fulvous, inclining to yellowish.

Under side of the primaries deeper fulvous; summit washed with ferruginous; the lunules of the extremity are scarcely indicated.

Under side of secondaries reddish; all the spots are nacred, except the transverse ray, which precedes the ocellated ones; marginal lunules small, not very triangular, bordered by a brown arc.

The nacred spots of the under side of the female are more dull and smaller than in the male, and the transverse black points of the primaries are nearly all pupilled.

Labrador.

13. **A. polaris** *Boisd.* Boisd. et Lec. p. 159. Figured in Boisd. Icon. Hist. pl. 20.

Size of *A. myrina*. *Primaries* have nearly the same design as *A. frigga*, of Europe. The base is less obscure, and the points which precede the terminal edge are smaller.

Under side of secondaries ferruginous brown. The base is

marked with four small white spots. Towards the middle, there is a transverse, irregular white band, slightly powdered with brown, and divided by the nervures, which are russety. Beyond this band, there is another white band nearly macular, of which each spot is bordered by a clear yellowish space, and is marked by a black-brown point, corresponding to those of the opposite surface; the terminal edge is divided by small white lines or streaks, inflated at their anterior extremity. These wings are bordered with white. Fringe alternately white and black, and the white part forms below with the small white marginal lines, a kind of T.

The *female* differs from the male only in having the spots and white bands of the secondaries a little clearer.

Labrador.

Boisd.

14. A. chariclea *Godt.* Encyc. Méth. IX, 273. Figured in Herbst, pl. 272.

Nearly the size of *A. myrina.*

Upper side fulvous, traversed by black zigzag lines and by a row of black points, situated before the marginal lunules.

Under side of primaries fulvous, with the apical extremity yellowish, and a terminal row of small streaks of yellowish-white, which intersect the fringe and terminate in a small blackish arrow-shaped spot.

Under side of the secondaries purple-brown, deeper towards the base, which is marked with three small nacred spots; a little before the middle is another nacred band, sinuous, bordered with black-brown, and often powdered with ferruginous, especially in the males; between the spots of the base and this band, there is an isolated silver point, usually pupilled with brown. The posterior half of these wings is of a clearer tint, with some whitish reflections, especially near the transverse band—a row of purple-brown points, corresponding to the black points of the upper side, and at the extremity a terminal series of nacred triangular lunules, pointed with brown. Often in the males, all these lunules are strongly powdered with brown, and then are only indicated by a small white line, similar to those of the primaries.

Female a little larger than the male, sometimes a little more sombre above. On the under side, the nacred spots forming the

transverse band and the marginal lunules are more brilliant and more rarely powdered with ferruginous brown.

Labrador.

Boisd.

MELITAEA Fab.

In generic characters nearly similar to *Argynnis*. *Wings* usually blackish and fulvous, *subdenticulate*, spotted like a chess-board. *The nacre on the under side of the secondaries of Argynnis is here replaced by yellow or violet pearly reflections.* Discoidal cellule of the secondaries always open.

1. **M. phaeton** *Fab.* Syst. Ent. 481. Figured in Cram. pl. 193. Drury I, pl. 21. Herbst, pl. 3. Boisd. et Lec. pl. 47, p. 167.

Wings obscure black, with a marginal series of fulvous spots, more or less triangular, preceded by two transverse rows of yellow points. The *primaries* have, besides, two fulvous spots in the discoidal cellule, followed outwardly by some yellow dots.

On the *under side*, the base of each wing is marked with fulvous spots intermingled with yellow dots.

Body black; *palpi* and *feet* fulvous; *abdomen* spotted with yellow below, and pointed with yellow on the sides; *antennæ* blackish; club a little ferruginous.

United States.—Expands two and three-eighths inches.

Boisd.

2. **M. ismeria** *Boisd.* Boisd. et Lec. pl. 46, p. 168.

Upper side yellowish fulvous, with a large number of black spots; some placed confusedly towards the base, forming zigzag rays; others forming two transverse sinuous rays on the primaries and a single one on the secondaries, where it is followed by a row of points of the same color.

The outer edge of the four wings is black, divided on the primaries by fulvous spots and on the secondaries by a line of crescents, which are yellowish-white. Besides these, the summit of the primaries is marked by four or five white dots.

The *under side* of the primaries has a whitish macular band before the outer edge, preceded by three or four spots of the same color.

Under side of the secondaries fulvous, with white spots towards the base; then a median, transverse, irregular band, and finally marginal lunules of the same color. These last are separated from the transverse band by a series of blackish points corresponding to those of the upper side.

Fringe of all the wings blackish, intersected by white.

Body and *antennæ* as in the analogous species.

Larva yellow, with spines and three longitudinal rays, blackish.

Head black, as well as the scaly feet and abdomen on under side; other feet yellow.

Chrysalis ash-gray, with some clearer spaces; the small dorsal tubercles nearly white.

Southern States.—Expands one and three-eighths inch.

Boisd.

3. **M. tharos** *Cram.* *M. tharossa* Godt. Encyc. Méthod. IX, 289. Figured in Cram. pl. 169. Drury, I, pl. 21. Boisd. et Lec. pl. 47, p. 170.

Wings fulvous, with black wavy lines, more or less wide, often confluent or interlaced. A wide black border on the outer edge, a little sinuous within, marked on the primaries with a fulvous yellow spot, and divided on the secondaries by a regular sinuous line of grayish, preceded by a row of black ocular dots.

The *upper edge* of primaries black; from which, at the end of the discoidal cellule, there proceeds a black streak, which loses itself in the sinuous lines.

Under side of the primaries fulvous, with ferruginous wavy lines, very fine and indistinct. The border is more brown, mingled with the fulvous and marked with a yellow spot larger than that on the upper side.

The *under side* of the secondaries is ochre yellow, with a large number of wavy, brown ferruginous lines; a brown border, touching neither the anal nor external angle, marked by a yellow crescent. This border is preceded by a row of small brown dots, corresponding to those on the upper side.

Body black above, yellowish below.

United States.—Expands an inch and an eighth.

Boisd.

4. **M. editha** *Boisd.* Ann. Soc. Ent. 2me sér. X, 305.

Boisduval says, it is possible that this species is the same which Doubleday and Hewitson have figured in pl. 23 of their work as

M. anicia, but unfortunately they have not represented the under side, which in many species it is important to know. The upper side of the secondaries of their *M. anicia* has a marginal series of three fulvous bands, whilst in this species the intermediary range is pale yellow.

Upper side blackish-brown, with the fringe whitish, some spots of bright fulvous and some yellow spots disposed in transverse bands; the four bands of the secondaries alternately yellow and fulvous, interrupted; the one before the last yellow and that which precedes it fulvous, the spots slightly pupilled with yellow; the upper edge of the primaries reddish.

Under side fulvous, with bands ochry yellow, more or less edged with brown; that of the secondaries, with each spot of the antepenultimate band, pupilled with ochry yellow.

The *female* is nearly similar to the male, with the primaries a little more rounded at the summit.

California.

Boisd.

5. **M. palla** *Boisd.* Ann. Soc. Ent. 2me sér. X, 305. *M. nycteis* Doubleday.

Upper side bright fulvous.

Under side of primaries fulvous, with a terminal band of ochry yellow.

Under side of secondaries fulvous, with two bands of ochry yellow, edged with brown, and some basal spots of the same color, forming an irregular band; posterior band nearly terminal, formed by crescents more or less large; that which precedes it is cut longitudinally by two irregular blackish lines.

The *female* is very different from the male; the spots of the under side are usually of a pale ochry yellow, except the small marginal crescents and the antepenultimate band of the secondaries, which are fulvous. On the under side the ochry yellow bands cover nearly the whole surface, and the fulvous is reduced on the secondaries to marginal crescents, a row of five or six large points, and some basal spots.

California.

Boisd.

6. **M. zerene** *Boisd.* Ann. Soc. Ent. 2me sér. X.

Upper side bright fulvous, as in *M. cybele*, with the black markings as in the species of the same group.

Under side of primaries fulvous, with the markings of the upper. The summit has spots of a yellowish-white, and the edge is divided by small crescents of the same color.

Under side of secondaries ferruginous gray, with spots of yellowish-white, as in the neighboring species, but not silvery; the spots of the middle and the marginal crescents are environed and surmounted with ferruginous, more obscure than the general tint.

Female a little larger than the male, with the under side ferruginous gray, paler, and sometimes the marginal crescents a little silvery.

California.

Boisd.

GRAPTA Kirby.

Nearly allied to *Vanessa*, from which it may be distinguished by its more excised and angular wings, and its less hairy palpi. All the known species have the upper surface more or less brightly fulvous, spotted with black; lower surface crowded and veined with different shades of brown; the secondaries have a more or less angular silvery or pale golden mark, resembling sometimes the letter L or C, whence the name *C-album*, &c. &c.

The *larvæ*, like those of the neighboring genera, have the second and third thoracic and also the abdominal segments armed with spines, which are set round with whorls of delicate bristles.

Pupa angular and tuberculated; head rather deeply notched, generally brown or grayish-brown, with silvery or golden blotches.

1. **G. interrogationis** *F.* E. S. III, 1, 78. *G. aureum* Cram. Figured in Cram. pl. 19. Sm. Abb. I, pl. 2. Boisd. et Lec. pl. 51, p. 192.

Upper side of all the wings fulvous or ferruginous fulvous, with seven or eight unequal black spots, and the outer edge sometimes brown, obscure, and sometimes of a ferruginous tint, mingling insensibly with the ground color.

Upper side of secondaries deep brown, with a greenish blue reflection and the base red ferruginous.

Under side of all the wings grayish, marbled with brown; sometimes ferruginous or brownish, with the extremity a little more clear; often brown, slightly glossed with greenish white, especially on the secondaries. On the disk, a silvery spot, sometimes in the form of a C, sometimes in the form of an interrupted C or mark of interrogation. In most of the varieties, there is a row of black points on the terminal edge of each wing. The secondaries are furnished with prominent tails.

Larva deep brown, with the body pointed and striated with yellowish and whitish. Head and feet reddish, spines blackish. Along the feet a ray of citron yellow, and above the stigmata another ray of the same color, marked with a row of red spots.

Chrysalis angular, obscure, with golden spots. Feeds on *Ulmus* and *Tilia*.

United States.—Expands two and three-quarter inches.

Boisd.

2. G. comma *Harris*. Ins. Mass. 221 (1842).

Upper side tawny orange; fore wings bordered behind and spotted with black; hind wings shaded behind with dark brown, with two black spots on the middle and three more in a transverse line from the front edge, and a row of bright orange-colored spots before the hind margin; hind edges of the wings powdered with reddish-white.

Under side marbled with light and dark brown, the hinder wings with a silvery comma in the middle.

The *caterpillar* has a general resemblance to that of *G. interrogationis*.

Chrysalis brownish gray, or white variegated with pale brown and ornamented with golden spots; there are two conical ear-like projections on the top of the head, and the prominence on the thorax is shorter and thicker than that of *G. interrogationis*, and more like a parrot's beak in shape.

Expands from two and a half to two and three-eighths inches.—*Harris, Insects of Mass.*, p. 221.

Harris thinks that his *G. comma* is different from the European *G. C-album*, which Boisd. et Lec., p. 190, describe as occurring

here, and for the purpose of comparison, their description is inserted :—

3. **G. C-album** *Linn.*

Nearly the size of *G. progne.*

Upper side fulvous or ferruginous, with scattered black spots; outer edge more or less obscure.

Under side sometimes brownish-black, sometimes brownish-yellow, with green atoms on the outer half, which, with the exception of the costal margin, is always lighter.

Under side of secondaries has a G or C of pure white on the disk.

Body blackish, with greenish hairs on the thorax.

Antennæ black above, brown below, with white rings; extremity of the club reddish.

Environs of Philadelphia only.

Bois. et Lec.

VANESSA Fab.

Clothed with long hairs, eyes densely hairy; labial palpi porrect, projecting beyond the forehead, scaly and densely hairy all round; first joint much curved, second swollen beyond the middle, third nearly acicular. Antennæ about three-fourths the length of the body, with two distinct grooves below; club rather short, last joint minute, pointed. Thorax clothed with long hairs. Primaries subtriangular, apex truncate. Anterior margin but little curved, sometimes deeply emarginate; inner margin nearly straight, costal nervure rather stout, extending about to the middle of the anterior margin. Secondaries somewhat obovate. Inner margin the longest; outer margin more or less sinuate, dentate, prolonged into a tooth or short tail at the termination of the third median nervule. Abdomen about two-thirds the length of the inner margin of the posterior wing. Larva cylindric, head and first thoracic segment unarmed, the rest armed with long spines, set with setæ in whorls. Pupa very angular and tuberculate; head deeply bifid, often adorned with golden spots.

Vanessa differs from *Grapta* in the palpi, which are much less,

hairy, and in the wings in not having the inner margin of the primaries emarginate. The larva of *Vanessa* differs in wanting the spines on the head.

1. **V. J-album** *Boisd.* Figured in Boisd. et Lec. pl. 50, p. 185.

Upper side dull yellow or fulvous, with the base of the primaries and a part of the secondaries more obscure. A little before the outer edge, there is a brown ferruginous or blackish ray, which on the primaries of the male often blends with the terminal edge, which is nearly always powdered with blackish. The primaries have four or five unequal spots on the middle and on the upper edge, three short transverse bands of the same color, of which that on the summit is separated by a white spot. The secondaries have the upper edge black, divided by a white spot.

Under side of the wings brown, from the base to the middle, with waves more pale and others more obscure; then, grayish-white reticulated and a marginal interrupted ray of ashy blue. On the middle of the inferiors, there is a small grayish mark in the form of a J.

North and West.—Expands three inches.

BOISD.

2. **V. milberti** *Godt.* Encyc. Méthod. IX, 307. *V. furcillata* Say. Boisd. et Lec. pl. 50, p. 187. Say, Amer. Ent. II, pl. 27.

Upper side brownish-black, traversed between the middle and the extremity by a wide fulvous band, a little sinuous within, where it has a paler tint, followed on the secondaries by a marginal row of violet-blue crescents.

The *primaries* have two fulvous spots in the discoidal cellule, a black spot in the band on the costal edge, and a white spot besides.

Under side blackish, with waves more obscure, and a band of paler tint corresponding to that of the upper side.

Body blackish-brown.

Northern States.—Expands an inch and a half.

BOISD.

3. **V. progne** *Cram.* Figured in Cram. pl. 85. Boisd. et Lec. pl. 50, p. 188.

Upper side bright fulvous, a little paler at the extremity of the primaries. These have five black spots, of which two are in the discoidal cellule and three below the median nervure; two short

brown bands along the upper edge, one at the end of the discoidal cellule and the other near the summit, from which it is separated by three or four crescents paler than the ground color. Towards the internal angle, there is a brown spot slightly united to the border, which is deep brown.

The *secondaries* have the extremities blackish, insensibly mingling with the fulvous, which is marked with two small black spots. A little before the outer edge, there is a row of fulvous spots, sometimes indistinct. The angulated tails of the secondaries are tinted with grayish-violet, and the emarginations of all the wings are bordered with yellowish-gray.

Under side brown, striated with blackish, with a paler band towards the outer edge, angulated on the primaries; a white mark on the disk of the secondaries, which has a faint resemblance to the letter L.

Some *female* specimens have along the marginal edge on the *under side* some shining greenish crescents, more or less distinct, and nearly united in a continuous line. These have the *upper side* of a less brilliant fulvous.

United States.—Expands two inches.

Boisd.

4. V. antiopa *Linn.* Syst. Nat. II, 776. Figured in most of the European works.

Upper side velvety black chestnut, with a yellowish terminal band, the internal side of which is a little sinuous, preceded by a line of seven or eight dots of violet-blue.

The *primaries* have the upper edge finely interrupted with yellowish-white, and marked between the middle and the bluish points with two transverse and parallel spots of the same color as the border.

Under side obscure black, with wavy lines of deeper color, and a small central grayish point.

Body and *antennæ* black; club ferruginous.

United States and Europe.—Expands three inches.

Boisd.

5. V. lintneri *Fitch.* Third Report to N. Y. State Agr. Soc., p. 485 of Trans.

Wings of the same form and color of *V. antiopa*, but their pale border is twice as broad, occupying a third of the length of

the wings, and is wholly destitute of the row of blue spots which occur in *V. antiopa* forward of the border. Ground color deep rusty brown, much more tinged with liver reddish than in *V. antiopa*. The fore margin of the anterior wings is black, freckled with small transverse white streaks and lines, but is destitute of the two white spots of the other species. The broad outer band is of a tarnished pale ochre yellow hue, speckled with black, and becomes quite narrow at the inner angle of the hind pair. Wings beneath similar to those of *V. antiopa*, but are darker and without any sprinkling of ash-gray scales or any whitish crescent in the middle of the hind pair, and the border is speckled with gray and whitish in wavy transverse streaks, without forming the distinct band which is seen in *V. antiopa*.

FITCH.

[Probably a variety of *V. antiopa*.—J. G. M.]

6. V. californica *Boisd.* Ann. Soc. Ent. 2me sér. X, 306.

Upper side bright fulvous; primaries with three black bands on the upper edge, as in the allied species, and only three large points on the disk; a white ante-apical streak; the edge of all the wings blackish, but destitute of blue crescents.

Under side paler, with the transverse band very angular.

California.

BOISD.

PYRAMEIS DOUBLED. & HEWITS.

Differs from *Vanessa* in having the wings less angular, palpi less hairy, and in somewhat different form; the club of the antennæ is rather more pointed; larvæ have all the segments except the head and prothorax armed with long spines, set round with whorls of stiff bristles. They differ also in habits; those of *Pyrameis* are always solitary, drawing together the sides of a leaf with silken threads, and thus forming a cylindric dwelling; the pupæ are similar in shape and markings.

1. P. atalanta *Linn.* Syst. Nat. II, 779. Figured in most European works on Lepidoptera.

Upper side black, with a red band. The band of the secondaries is marginal, with four black dots on it, terminated at the anal

angle by a double bluish spot. The band of the primaries is arcuate, slightly interrupted in the middle. Summit slightly bluish, with six white spots, of which the interior, in the form of a transverse band, rests on the costal edge.

Under side of the primaries nearly similar to the upper, but the summit is brown mixed with gray. The red band is paler at each extremity, and separated from the white spots by a bluish ring. At the base there are several streaks of the same color.

Under side of secondaries brown, slightly marbled with gray; a yellowish spot on the middle of the costal edge, and some bluish atoms on the lower edge, which is more or less grayish. Emarginations white.

Body of same color as the wings. *Antennæ* annulated with white and black; club yellowish.

Larva differs in its tints—sometimes of a yellowish-green, sometimes violet powdered with gray; spines moderate, and a sinuous, lateral band of citron yellow. Feeds on *Urtica*, and is almost constantly enveloped between several leaves, drawn together by silk threads.

Chrysalis blackish, moderately angular, covered with a grayish efflorescence, and ornamented with golden spots.

United States and Europe.—Expands two inches and a half.

Boisd.

2. P. cardui *Linn.* Syst. Nat. II, 776. Figured in most European works.

Upper side of primaries at the base and internal edge russety brown; the middle fulvous, nearly cherry-red; border black, transverse and angulate. Summit widely black, with five white spots, of which the interior is largest, and rests transversely on the edge; the four others are in the form of unequal dots, and ranged in an arc. Posterior edge entirely black, with white emarginations.

Upper side of secondaries fulvous, more or less reddish, with the base, the internal edge and disk russety brown, and three posterior and parallel rows of black points, of which the intermediary are oblong and smallest; the exterior are marginal, the interior only four in number, and sometimes slightly ocellate.

The *under side* of the primaries has the same markings as the upper, but the fulvous of the middle still more approaches red. The black band which divides it is marked with white near the costal edge, and the summit is greenish-brown.

Under side of secondaries marked with brown, white and yellowish, with a row of four ocular spots, separated from the edge by a grayish line, along which there is a series of small bluish crescents formed by atoms.

Body russety brown above, whitish below, with black rings on the abdomen.

Larva spinous, brownish or gray, with lateral and interrupted yellow lines. Feeds on various species of *Carduus*, *Serratula*, and *Cirsium*.

Chrysalis grayish, moderately angular, scattered with golden spots, which sometimes cover nearly the whole surface.

Inhabits the four quarters of the globe.—Expands two and a half inches.

3. **P. huntera** *Sm. Abb.* *P. virginiensis* Drury. *P. iole* Cram. Figured in Sm. Abb. pl. 9. Cram. 12. Drury I, pl. 5. Boisd. et Lec. pl. 48, p. 180.

Size of *P. cardui*, and in many respects similar, but the outer edge of the primaries is usually more emarginate; the summit has a slight blue reflection, and it is browner on the under side. The interior white spot is more narrow and bent outwards. There is a white point between the extremity of this band and the internal angle.

Upper side of secondaries also very similar to *P. cardui*.

The *under side* is brown, slightly obscure, with nervures of a yellowish-white, crossed near the base by two lines of this color. In the middle, there is a transverse band of white, a little grayish, or of a rosy white, followed exteriorly by *two ocellated spots*. Near the posterior edge, there is a marginal band of nearly the same tint, divided in its length by a violet undulated line.

In the *females*, the tint of the upper side is sometimes carmine or brick color.

Larva blackish-gray striated with yellow, with the segments more clear, and the first rings more obscure. Along the feet, and below the stigmata, a yellow lateral ray, and above these another yellow ray, marked with a small orange spot above each stigma. The spines are yellow. Feeds on *Gnaphalium obtusifolium*.

Chrysalis yellowish, of the same form as that of *P. cardui*, scattered with a large number of golden spots.

United States.

Boisd.

JUNONIA Doubled. & Hew.

This may be distinguished from the allied genera by the naked eyes and less hairy anterior legs. In the other genera, these legs are densely clothed with long hairs, and this is also the case with the females of *Vanessa* and *Pyrameis*, but in *Junonia*, though the legs of the males are thickly set with fine hairs, they are short, and do not so entirely cover the legs as to make it difficult to detect their form and even their articulations. The cells of both pairs of wings are always open, except in a few aberrant species. Larvæ, with the head and all the segments armed with spines, which make them resemble the larvæ of *Argynnis* rather than those of *Vanessa*. Pupa tuberculated, scarcely angular.

1. **J. coenia** *Hübn.* *J. orythia* Sm. Ab. *J. larinia*, var. Godt. *J. junonia* Hübn. Figured in Hübn. Exot. Samml. Sm. Abb. I, pl. 8. Boisd. et Lec. pl. 49, p. 182.

Upper side obscure brown, with two black ocellated spots; iris grayish-yellow; pupil blue—the lower one much the larger. They are preceded by a fulvous ray, followed by a double grayish marginal ray, almost obsolete in the primaries. These have towards the base two fulvous streaks bordered with black, and between the two ocellate spots a white band or yellowish-white, going from the summit to the terminal edge. There is also a small white spot above the upper ocellus.

The two ocelli of the secondaries are also of unequal size. The upper one is in part encircled by fulvous, in part by black. It is nearly covered with violet-blue atoms. The inferior one is similar, but much smaller.

The *under side* of the primaries is fulvous towards the base, with some grayish lines bordered with black; paler towards the end, with the two ocelli and the separating band as on the upper side, and ordinarily a second small eye above that of the summit.

The *under side* of the secondaries is ferruginous gray, with more obscure wavy lines and a transverse ferruginous brown band, marked with two or three small eyes and two blackish points.

Body of same color as the wings. *Antennæ* whitish, with the club blackish. Expands two inches and a half.

Larva blackish, pointed with white; lower side of abdomen and feet fulvous. It has two lateral white lines, of which the upper is marked with a row of fulvous spots. Spines blackish.

Chrysalis like those of *P. cardui* and *P. huntera*, but blackish, varied with whitish, without any metallic spots.

Southern United States.

Boisd.

ANARTIA Doubleday.

Head rather small, scaly; eyes round, a little prominent; proboscis twice the length of the body; labial palpi scaly; antennæ nearly as long as the body; club short, compressed, pointed; thorax oval, rather robust; primaries subtriangular, rounded at the summit; external edge a little emarginated towards the middle; internal edge slightly emarginate, external edge of secondaries sinuous, dentate, and forming a tooth at the end of the third median nervure; internal edge emarginate before the anal angle; feet of the first pair of the male scaly, femurs scarcely more robust than the tibiæ; tarsi subcylindrical, thin; those of the female scaly, more robust, femurs nearly cylindrical; tarsi of five joints nearly as long as the tibiæ; feet of the second and third pairs rather elongate; abdomen thin, rather short.

1. **A. jatrophae** *Linn.* Syst. Nat. II, 779. Figured in Cram. pap. pl. 202. Herbst, tab. 172.

Upper side with a more or less livid tint, with brownish, transverse, undulated lines, and three black, ocellate spots, of which one is on the primaries towards the internal angle, and the other two on the secondaries. Some specimens have the extremity of the wings russety, and the line which divides it forms parallel to the edge, a double row of lunules of this color.

Under side paler, and the ocellate spots have a small whitish pupil. *Antennæ* black, with the club ferruginous. *Body* dark above, whitish below.

Texas—Brazil.

Godt.

Fam. VI. LIBYTHEIDAE.

Larva without spines, slightly pubescent, finely shagreened. *Chrysalis* short, a little angular. *Perfect insect;* palpi very long, contiguous, in the form of a beak, parallel to the axis of the body. Wings angular, rather robust; discoidal cellule of the secondaries open.

LIBYTHEA Fab.

Inferior palpi in the form of a rostrum or beak. Primaries angular. Antennæ short, stiff, fusiform.

1. **L. motya** *Boisd.* Figured in Boisd. et Lec. pl. 64.

Wings brown; middle of primaries fulvous, beginning at the base; towards the upper angle three white spots, one near the costal edge, oval, the other two smaller and square.

Secondaries with a large pale yellow space in the centre, commencing at the base, and a whitish one on the side.

Under side of primaries similar to the upper, excepting that the fulvous part and the spots are intersected by the nerves, black.

Under side cinereous, with a darker band extending over half the wing, and a crescent streak near the outer edge.

United States.—Expands nearly two inches.

Boisd.

2. **L. bachmani** *Kirtland.* Var? of *L. motya.* Figured in Silliman's Journ., XIII, New Series, 356.

Body, dark brown; upper surface of primaries brownish, with three white spots placed in a triangle near the tip, the superior and interior spots oblong and irregular, the exterior smallest and oval, the inferior quadrangular. An ochry yellow band is situated on the humerus, and a second on the posterior margin, but does not reach the tip of the wing. A similar band extends across the lower half of the secondaries.

Under side of primaries similar to the upper; that of the secondaries reticulated with brown.

Expands one and five-eighths of an inch, while *L. motya* expands more than two inches.

The form and size of the white spots in the primaries differ; the absence of a large white quadrangular spot and a different arrangement of the yellow bars mark this as a new species.

Ohio.

KIRTLAND.

NYMPHALIS LATR.

Head a little more narrow than the thorax; eyes large, prominent; palpi moderate, a little longer than the head; last article much shorter than the preceding, obtuse; *antennæ* nearly the length of the body, insensibly enlarging in an elongate club; *wings* wide, rather robust, dentate, *always destitute of ocelli and prolongations in the form of a tail.*

1. **N. ursula** *Fab.* Ent. Syst. III, 1, 82. *N. ephestion* Godt. *N. astyanax* Fab. Figured in Stoll, suppl. à Cram. pl. 25. Sm. Abb. I, pl. 10. Boisd. et Lec. pl. 53, p. 199.

Wings slightly dentate; blackish-brown above, glossed with a bluish tint, much more deep towards the extremity of the secondaries. These have parallel to their terminal edge a double festooned black line, preceded by a bent transverse ray of the same color; three rows of bluish crescents, of which the interior are much the largest. In the female, the blue occupies less space, and the crescents which form the first row are truncate, less marked, smaller, and each one supported behind by a fulvous point.

The *primaries* have the summit more brown than the rest of the surface, and marked by one or two small white spots. The posterior edge has two rows of blue or slate-colored crescents, preceded within by a row of fulvous points often indistinct, and existing sometimes only on the half of the wing nearest the upper edge.

Under side is brown, a little reddish, glossed, in the male by a violet-blue tint, except at the summit of the primaries. The base of these is marked in the cellule by two fulvous spots, surrounded with black and environed with blue; the base of the secondaries has three nearly similar spots; the origin of the upper edge of all the wings is fulvous; the terminal edge of all has two rows of blue crescents, preceded within by a row of fulvous spots bordered with black behind.

Body blackish, with the under side of abdomen whitish.

Larva whitish or russety white with green shades, which cover a part of the back; the second ring is armed with two long ferruginous horns, a little arcuate; the fifth bears two roundish tubercles, of the same color. The other tubercles are greenish and not prominent.

Chrysalis russet, with the under side of the abdomen whitish, and a prominent projection on the back. Feeds on *Salix*, *Vaccinium*, and *Cerasus*.

United States.—Expands three and a half inches.

BOISD.

2. N. arthemis *Drury*. *N. lamina* Fab. Godt. Figured in Drury, II, pl. 10. Boisd. et Lec. pl. 54, p. 202. Say Amer. Ent. II, pl. 23.

Upper side brownish-black, with a common white band a little beyond the middle, and a double series of blue marginal crescents on the secondaries, and only one on the primaries. These have at the summit two or three small white spots, and the secondaries, in the males, a bent row of seven roundish spots, or large fulvous dots, situated between the band and the blue crescents.

The *lower side* differs from the upper in having the ground color more pale, excepting on the outer edge where it remains blackish; at the base of each wing there are some bluish spots, accompanied by large reddish points; the primaries have a series of reddish points before the double line of blue lunules of the extremity.

Emarginations of all the wings white. *Body* black, with three white lines along the abdomen. *Antennæ* black.

The *female* is larger than the male; the bent row of large fulvous points is replaced above by lunules formed of bluish atoms; below, it has the same markings as the male.

Northern States.—Expands three and a half inches.

BOISD.

3. N. disippus *Godt.* Encyc. Méthod. IX, 392. *N. misippus* Fab. *N. archippus* Cram. Figured in Cram. pl. 16. Boisd. et Lec. pl. 55, p. 204.

Upper side fulvous, with nerves and edges black; the terminal edge has two rows of white points, the exterior are the smaller, and placed in the emarginations; near the summit of the primaries, where the black dilates sensibly, are three white points, followed by a macular and transverse band of four fulvous spots.

The *secondaries* are traversed beyond the middle, reaching from the external edge to the anal angle, by a bent, black ray.

Under side has the ground color and fulvous spots of the summit more pale; the interior points of the terminal edge are replaced by a double series of white lunules; there are two white spots on the costal edge towards the base, and sometimes a point near the base of the cell.

Antennæ black as well as the body; the latter is pointed with white on the head and breast.

The *female* is somewhat larger than the male, and the second row of crescents on the under side of the wings is a little bluish.

Larva green, varied with white; the first rings are russety. The second ring bears two spiny horns, a little arcuate in front; the third, fifth, sixth, seventh and tenth has each a small spiny process, and the eleventh two short spines. Feeds on *Salix* and *Prunus*.

Chrysalis russety, with the sides of the abdomen varied with white, and a prominent projection on the back.

United States.—Expands from two inches and a half to four inches.

Boisd.

4. **L. lorquini** *Boisd.* Ann. Soc. Ent. 2me sér. X, 301. *L. eulalia* Doubled.

Upper side brown-black, traversed toward the middle by a white macular band, preceded on the primaries in the discoidal cellule by a spot of the same color; primaries, with the summit very widely ferruginous red, separated from the brown part by three or four white spots. Secondaries with two large fulvous points towards the anal angle.

Under side brown, with the same band and the same white spots as above; the common band followed by a ferruginous space, divided by a series of whitish sagittate crescents, bordered with black at the summit; that of the primaries with two ferruginous streaks in the cellule; that of the secondaries with the edge whitish, and the base intersected by whitish-gray spots.

California.

Boisd.

PAPHIA Doubleday.

Wings with a metallic gloss, under side indistinctly reticulated; female with the upper side more variegated with brown or pale-colored spots than the male. Head not tufted in front; eyes large,

prominent. Labial palpi thickly squamose, broad in front. Antennæ short, slender; club slender, obliquely rounded off at tip. Primaries large, fore margin strongly arched, somewhat elbowed near the base, apical angle more or less acute; apical margin sometimes deeply emarginate near the tip. Secondaries subovate, costal margin rounded, outer margin sometimes scolloped; the extremity of the third branch of the median vein being extended into a tail. Abdomen rather small and subovate.

1. **P. glycerium** *Doubleday.* Figured in Doubleday and Hewitson's Genera, pl. 50.

Upper side copper red; margin of all the wings brownish interiorly, powdered with the same color; primaries with two short brownish bands commencing on the costal, the one nearest the apex undulate; the brownish margin extends about one-third on the anterior edge, with a deep emargination near the summit.

Under side paler, of the color of dead leaves; the bands on the primaries longer than above, and a transverse band on the secondaries separating the deeper shade of the base from the other part; an indistinct white spot near the upper edge.

Female larger, paler, markings in the primaries more distinct and wide; similar below.

Texas—Illinois.

APATURA Fab.

Eyes large, prominent; *antennæ* rather long, terminated by an elongated cylindrical club, the end of which is yellow; *palpi* contiguous; *thorax* long and robust; *abdomen* proportionately small; *wings* slightly dentate, often with a bluish reflection, the secondaries with the cellule open and having at least one ocellus on the under side; the primaries always have the outer edge more or less concave, and in the discoidal cellule on the under side two or three black transverse streaks. The secondaries are also somewhat concave above the anal angle.

The *Apaturæ* resemble *Satyri* in the form of the *larva* and in

the *ocelli* on the under side of the wings, but differ in habits; the former live on trees, the latter on low grounds and grasses.

1. **A. clyton** *Boisd.* Boisd. et Lec., 209, pl. 56, p. 208.

Primaries reddish-yellow or fulvous, with the extremity brownish, marked with two rows of small spots and a marginal interrupted ray, ochry yellow. The fulvous portion has two black streaks on the discoidal cellule, and is separated from the brownish by a sinuous blackish ray.

The *secondaries* are obscure rufous, gradually becoming brownish towards the extremity. This part is divided by a row of five black points ocellated with rufous, preceded by a series of quadrangular spots a little more clear than the ground color and followed by a yellowish marginal ray, as a continuation of that on the primaries. Besides these, there is near the middle a blackish, sinuous, transverse ray, very distinct at its origin on the upper edge.

Under side of all the wings is russety gray, with a violet reflection; an obscure marginal ray, and a median, black, transverse, flexuous ray, corresponding to that on the upper side, more distinct on the primaries, where it is preceded by two black streaks and followed by the same spots as above, but paler. This same ray is preceded, in the discoidal cellule of the secondaries, by two black streaks. The ocellated points have the pupil bluish-white. The emarginations of all the wings are feebly white.

Larva, which feeds on *Prunus* and other drupaceous plants, is green, with four rays of greenish yellow. Head yellowish-green, marked with two black spots and surmounted by two short ramose yellowish spines; the two small anal points are a little elevated.

Chrysalis green, with the envelopment of the wings and some indistinct dorsal rays greenish-yellow.

Southern States.—Expands nearly two inches and a half.

Boisd.

2. **A. celtis** *Boisd.* Boisd. et Lec., p. 210, pl. 57.

Same size and form of *A. clyton*.

Upper side pale russety gray. Outer half of the primaries brownish, marked with about a dozen small white spots disposed in two lines a little sinuous, of which one or two near the summit

are ocellated with black and very small. The exterior edge has a russety line, preceded near the external angle by a black eye ocellated by yellowish-red, on a line with the white spots of the second row. There are two black transversal streaks in the discoidal cellule.

The *secondaries* are traversed, towards the middle, by two indistinct curved lines of blackish-gray, and near the marginal edge by two parallel undulated lines of the same color, very distinct. These lines are preceded by a curved row of six black eyes, of which the second, counting from above, is the largest; the others sensibly diminish in size. The anal is very small and often wanting.

The *under side* is whitish, and has nearly the same markings as the upper. On the secondaries, the two curved lines of the middle are preceded, towards the base, by two or three small annular brownish spots. The ocelli are pupilled with white, and surrounded by a small yellow iris.

Upper side of the body brownish-gray. *Under side* whitish-gray. *Antennæ* brownish, with the club yellowish.

Larva, which feeds on *Celtis occidentalis*, is yellowish, with the sides more pale and nearly whitish. The back has a ray yellowish-green, bordered on each side by an obscure green line. The whitish part is also divided longitudinally by a green obscure ray. Head green, surmounted by two small bifid spines. The small anal points are a little raised.

Chrysalis yellowish-green, a little bifid.

Southern States.

Boisd.

AGANISTHOS Boisd.

Head nearly as wide as the thorax; *eyes* large, prominent; *antennæ* long, terminated by an elongated cylindrical club; *palpi* near together, converging at the extremity; *thorax* long, thick, very robust; *abdomen* proportionately small; *wings* not dentate, very strong and robust; the primaries have the outer edge very emarginate and the summit prolonged, which gives them a falcate form; the secondaries are rounded, without tails, the anal angle a little prominent; *both sides destitute of ocelli.*

1. **A. orion** *Fab.* Syst. Ent. 457. *A. odius* Sulz. *A. danae* Cram. Figured in Cram. pl. 84. Sulz. Gesch. pl. 13. Boisd. et Lec. pl. 52, p. 195.

Expands about five inches. *Upper side* of primaries brownish-black, with a fulvous, longitudinal band, which covers the anterior surface, terminating a little distance from the outer edge. On the upper edge there is an oblong white spot of moderate size.

The *upper side* of the secondaries is brownish-black, with the base obscure fulvous.

The *under side* of all the wings is brown shaded with gray, with two transverse bands more deep near the base; then two black lines equally transverse, which unite towards the internal edge of the secondaries. A white spot on the primaries, corresponding with that on the upper side; the terminal edge of all the wings is grayish-white on each side.

Upper side of the body fulvous, with the extremity brownish; *under side*, color of the wings. *Antennæ* ferruginous.

Florida. [Most probably not found in the United States.—Major Leconte *teste*, M.]

Boisd.

Fam. VII. SATYRIDAE.

Larva attenuate at the extremities and nearly pisciform, terminated by two anal points more or less prominent; head sometimes rounded, sometimes emarginate or bifid, or surmounted by two spines. *Chrysalis* cylindroid, not much angular. *Perfect insect;* palpi close, elevated, very hairy; body moderate; wings rather robust, abdominal edge of the secondaries forming a groove; discoidal cellule always closed; nervures of the primaries often much dilated at their origin.

CHIONOBAS Boisd.

Head not quite so wide as the thorax, closely connected with it; *antennæ* terminating in an elongated club, forming insensibly and occupying nearly the half; *palpi* remote, covered with fine hairs; last article very short; *wings* rounded; *primaries*, with the costal nervure feebly inflated.

The species of this genus differ from the other *Satyridæ* in

their pale, dull, livid, and, as it were, *diseased* color, indicating their far northern habitat.

1. **C. also** *Boisd. et Lec.*, p. 222. Figured in Boisd. Icones, pl. 40.

Wings of a dirty grayish tint, mixed with yellow, slightly transparent with some small brownish atoms, a little more dense near the fringe. The primaries have a little more uniform color, deeper at the base, with an oblique shadow on the median nerve. The secondaries are sufficiently transparent to observe the markings on the opposite side.

The *under side* of the primaries is more deeply powdered with brownish than the upper, with the upper edge and summit variegated with grayish and blackish.

The *under side* of the secondaries is brownish to the middle, with some grayish atoms, and marbled with the same color near the external edge. The posterior portion is grayish violet, with blackish atoms and small undulations.

The *fringe* is grayish-white, interrupted with blackish.

Rocky Mountains of New Hampshire.

Boisd.

[Most probably *Sat. semidea* Say.—M]

2. **C. balder** *Boisd. et Lec.*, p. 216. Figured in Boisd. Icones, pl. 39. Boisd. Iconograph. du Regne Animal, pl. 80.

Upper side livid yellowish-brown, with the border a little more obscure. Primaries at the extremity have three pale yellow spots, of which two have a central black point. Secondaries, near the extremity, have a row of four or five pale yellow spots, cuneiform; the one nearest the anal angle usually has a black point.

Under side of primaries is more yellow than the upper, with the costal edge, apical point, and a part of the extremity, pale ash, sprinkled with brown.

Under side of the secondaries brownish, varied with ash-gray; a little blnish. It is traversed in the middle by a broad band, dentated, and forming a suite of nearly equal angles. The edge of this band and the extremity of the wing are more gray than the rest. Fringe white and black. Body brown; antennæ grayish at the base, pale testaceous to the end.

North Cape—Greenland—Labrador.

Boisd.

3. C. bootes *Boisd. et Lec.*, p. 218. Figured in Boisd. Icon. pl. 37.

Upper side yellowish-brown, mixed with gray; primaries towards the extremity with a blackish marginal ray, interrupted or indistinct. The arc which closes the discoidal cell is blackish, followed by a brownish angular impression.

Upper side of secondaries yellowish, with an obscure impression on the middle and towards the base. The border is of the same color as that of the primaries, and separated from the yellowish by a blackish macular ray. Fringe grayish-white divided by black.

Under side of primaries yellowish, with the summit and costal margin whitish, with brown points. The cellule is traversed by a blackish ray; beyond this, there is another blackish ray, more distinct, and bent into an acute angle on the median nerve.

Under side of the secondaries is whitish, the base varied with black—a wide, sinuous band traversing the middle. Extremity russety, pointed with brown; a macular, blackish ray; nerves white. Body brown; antennæ fulvous; base gray.

North Cape—Labrador—Greenland.

Boisd.

4. C. oeno *Boisd.* Figured in Boisd. Icones, pl. 39.

Wings thin and delicate; color livid brown, mixed with yellowish. Primaries nearly transparent at the extremity, which is more yellowish; apex and edge with some blackish atoms. Secondaries transparent, with some black atoms towards the edge.

Under side of the primaries more yellowish, with the summit and costal edge pointed with brownish.

Under side of the secondaries is marked with white and black, traversed by a blackish band, crenate. The extremity, with blackish atoms, forming a macular ray. Fringe white and black. Body brown. Antennæ as in the preceding species.

Lapland—Siberia—Labrador.

Boisd.

NEONYMPHA Hubner.

Body small, hairy; wings large, not diaphanous, uniformly colored above, more or less ocellated and strigose, especially beneath. Head small and slightly hairy. Antennæ very short, annulated with white, joints short, club robust, elongate; labial

palpi densely clothed in front with long, straight, bristly hairs. Thorax oval, very finely hairy. Primaries large, entire, fringed with fine hairs; costal margin slightly arched, veins delicate. Secondaries sub-triangular, costal margin arched, outer angle rounded, anal angle rather obtuse, outer margin entirely fringed with long hairs. Fore legs of the males small and feathery; fore legs of the females very small, slightly feathery. Four hind legs short, scaly. Femurs slightly clothed with hairs, tibial spurs distinct, claws much curved, entire, slender.

Larvæ elongate, thickest in the middle, longitudinally strigose, tail bifid. *Chrysalis* short and thick, with the head case rather incurved and obtuse.

1. **N. eurythris** *Fab.* Ent. Syst. III, 1, 137. *N. cymela* Cram. Figured in Herbst, pl. 196. Cram. pl. 132. Boisd. et Lec. pl. 61.

Wings entire, slightly brown on the upper side; primaries, at the extremity, with two black ocelli; iris yellow; double silvery pupil. These spots are separated from the outer edge by a triple blackish line.

Upper side of secondaries with three ocelli; the upper one small and widely separated from the two below; the middle one the largest, and it alone having the double silvery pupil.

The *female* has but two spots on the upper side of the secondaries.

Under side paler, with two brown wavy lines traversing the middle. Between the two ocelli, corresponding to those on the upper side, there are two double silver points.

Under side of secondaries has four spots, the upper and lower of which are the smallest. There are also two intermediary silver points, sometimes with an iris. Behind these spots are three blackish lines. Body brownish; antennæ annulated with white and black; club ferruginous.

United States.—Expands an inch and a half.

BOISD.

2. **N. gemma** *Hübner.* Figured in Boisd. et Lec. pl. 62.

Wings entire; upper side uniform pale brown, except on the lower edge of the secondaries, where there are three or four crescent-shaped black spots.

Under side paler. From the base of all the wings to the middle, there are short brown streaks. The primaries with two transverse brown lines, the outer one wavy, and the edge with a black ray. The secondaries are traversed by two wavy lines; towards the outer border, an irregular violet spot surrounded with black, enclosing two small silver points, one at each end. Between this and the edge is a series of silver points, confluent towards the anal angle.

United States.—Expands an inch and a half.

Boisd.

3. **N. sosybius** *Fab.* Ent. Syst. III, 219. *N. camertus* Cram. Herbst. Figured in Cram. pl. 293. Herbst, pl. 195. Boisd. et Lec. pl. 63.

Wings entire, brownish; upper side without spots; round the outer edge of all are three darker lines.

Under side, which is lighter, has three transverse, obscure, undulated lines. Discoidal cellule with a curved streak, and on the secondaries a similar streak extending obliquely from one line to the other, besides three fine lines round the edge.

The *primaries* have four or five ocelli, and the secondaries six.

The latter are black, with a simple white pupil and yellow iris; some of them are less distinct than others, and sometimes almost obsolete.

United States.—Expands an inch and a quarter.

Boisd.

4. **N. areolatus** *Godt.* Encyc. Méthod. IX, 494. Figured in Sm. Abb. I, pl. 13. Boisd. et Lec. pl. 63.

Wings entire, brownish; upper side without spots.

Under side paler, with two ferruginous transverse lines. Between these lines there is an elongated, ferruginous circle, in which the primaries have three or four ocelli, with a bluish pupil and yellow iris; the secondaries inclose in this circle six ocelli, of which the third, fourth and fifth are oblong, with the pupil oval.

Southern States.—Expands an inch and a half.

Boisd.

5. **N. canthus** *Linn.* Syst. Nat. 768. *N. boisduvalli* Harris. Figured in Boisd. et Lec. pl. 60.

Wings entire; bright brown above, darker towards the extremity, with four ocelli, two of which are not always distinct.

The *secondaries* have six ocelli; the anal one is of the ground color, with a black pupil, indistinct.

Under side paler, crossed with irregular wavy lines. The primaries have four ocelli, with the pupil white. The secondaries have six ocelli, five of which are contiguous.

United States.—Expands nearly two inches.

BOISD.

[Fabricius has united the following with the preceding, but Godart maintains that it is a distinct species.—J. G. M.]

6. N. cantheus *Fab.* Ent. Syst. 486.

Nearly the same size as *N. canthus*. *Upper side* blackish-brown, without spots. *Under side* lighter, with two ferruginous, oblique, common lines. The *primaries* have three small indistinct eyes. The *secondaries* have six, of which the fifth is large; the sixth, which is at the anal angle, small.

North America.

GODART.

EREBIA DALMAN.

Club of the antennæ gradual. Eyes naked. Tibia shorter than the tarsus. Only the costal of the primaries inflated. Species rather small in size; color dark brown; usually a ferruginous band or spots with small black eyes, pupils white. Sometimes the eyes are obsolete and in their stead only black spots. Under side paler; a dark band marbled. Outer edge rounded. Palpi with long hairs at the last joint; antennæ not annulated.

1. E. discoidalis *Kirby.* Faun. Bor. Am. IV, 298, pl. 3.

Body brown; antennæ annulated with white; wings entire, brown; costa spotted with gray; a triangular obscure reddish tawny discoidal stripe extends from the base to the posterior margin of the primaries, and is discoverable also on the under side, where the wing is faintly clouded with gray at the tip; the secondaries underneath are indistinctly marbled and clouded with gray or whitish; fringe whitish and brown alternately.

Canada.—Expands an inch.

KIRBY.

2. E. nephele *Kirby*. Faun. Bor. IV, 299.

Color brown above and beneath, but paler beneath. Antennæ annulated with white; knob slender.

Upper side is marked with an obsolete but broad submarginal band, in which there are two eyelets with a clouded white or bluish-white pupil, and a small black iris with a very indistinct brown ring. The posterior wings are crenate, and marked with a minute or obsolete black spot.

Under side, the belt of the anterior wings is much more distinct, eyelets bright, and the outer ring of brown plain; margin of the wing traversed with two or three lines parallel to the edge. Outer half of the hind wing paler and marked with six small eyelets, which form three rows, the largest eyelet being in the middle; the anal angles divaricate, leaving a wide triangular space.

Canada.

KIRBY.

SATYRUS FAB.

Eyes naked. Tibia long, with a spur at the end. One or two veins on the primaries inflated. Wings wide, limb of the primaries seldom rounded, that of the secondaries dentate. Upper side brown or black, usually with a broad whitish or yellowish band before the limb, and with ocelli in the primaries. Under side of secondaries marbled.

[Westwood, in second volume of Doubleday's, Hewitson's, and Westwood's Genera, proposes to limit the genus *Satyrus* to those species generally of large size, which are distinguished by having the costal and median veins of the primaries dilated at the base, the sub-median being simple, and by having the eyes naked.—J. G. M.]

1. S. alope *Fab.* E. S. III, 229. Figured in Boisd. et Lec. pl. 59.

Upper side blackish-brown; under side paler and finely undulated with black. Primaries on both sides, with a wide, yellow ochry band, concave behind, sinuous before, touching neither the upper nor lower edge. This band bears two ocelli, with blue pupils, the lower one sometimes indistinct or obsolete.

The *upper side* of the secondaries, usually towards the anal angle, has a similar ocellated spot.

The *under side* has a row of six; iris yellow, pupil blue, of which the two extreme and the intermediary are smallest.

Body of the color of the wings; antennæ annulated with white and black.

The *S. pegala* of Fab. is most probably only a variety which has but one eye on the primaries.

United States.—Expands two and a half inches.

Boisd.

2. S. ariane *Boisd.*

Upper side blackish-brown; primaries with two black ocelli pupilled with white, the iris a little paler; secondaries with a smaller eye often preceded by another small one without a pupil.

Under side brown, with the markings more obscure; the eyes of the primaries with a fulvous iris, preceded by a transverse brown line, and followed near the fringe by three very fine parallel lines; that of the secondaries is traversed in the middle by two sinuous brown lines, followed by an irregular row of six small black ocelli and more or less marked with blue.

The *female* is much larger than the male; the ocelli of the primaries are larger, circled with fulvous yellow; the small ocelli of the under side of the inferiors much less distinct than in the male.

California.

Boisd.

3. S. sthenele *Boisd.* Ann. Soc. Ent. 2me sér. X, 308.

Upper side brown, with the fringe ash-gray, intersected with black; that of the primaries with two small black ocelli with white pupil; that of the secondaries without spots.

Under side ash-gray, deeper at the base; that of the primaries with two larger ocelli circled with fulvous yellow, that of the secondaries traversed by a wide brown angular band and marked towards the anal angle by two small black ocelli with white pupil.

California.

Boisd.

4. S. pegala *Fab.* Ent. Syst. III, 494.

Body brown; primaries obscure brown, with a wide russety band which does not reach the edge. On both sides an eye with a white pupil.

Upper side of the secondaries obscure brown, with a black eye, white pupil and yellow iris.

Under side of various colors, with six eyes, of which three are united, the fifth very large. These eyes, which vary in number and form, are black, pupil whitish, and iris ferruginous.

North America.

GODT.

DEBIS BOISD.

Body rather small, wings large; secondaries generally angulated in the middle with a row of large ocelli; eyes prominent, hairy; labial palpi rather elongated, clothed in front with moderately short fine hair. Antennæ slender, club slender, with short joints. Thorax short, thick, hairy. Primaries triangular, ovate; fore margin strongly curved, apical angle rounded, apical margin but little if at all emarginate, costal vein dilated at the base. Secondaries subovate, more or less scolloped along the outer margin, which is generally deeply angulated or rather shortly tailed at the extremity. Fore legs very minute and thickly clothed with long silky hairs; tarsus slender, as long as the tibia, and destitute of joints or claws. Fore legs of the females rather larger than those of the males, slender, scaly, destitute of hairs; tarsal articulations concealed by scales, obliquely truncate at tip, where there are a few short spines. Tibial spurs of the hind legs rather long.

1. **D. andromacha** *Hübn.* Figured in Say, Amer. Ent. II, pl. 36.

Body above and the superior surface of the wings brown; primaries beyond the middle, with a broad paler band, bifid before, and including a series of four fuscous oval spots or epupillate ocelli, of which the second and sometimes the third are small and the posterior one largest; between the band and the exterior edge is a single narrow pale line, sometimes obsolete; exterior edge alternately white and black; secondaries with a narrow fuscous, angulated line across the middle, and a broad pale band beyond the middle, in which is a series of five fuscous epupillate ocelli with a yellow iris, the third smallest, then the fifth, the first being largest,

exterior margin slightly tinged with rufous and with one or two fuscous lines.

Under side perlaceous, with a brown narrow band before the middle; beyond which is a broad lighter perlaceous band, in which on the primaries are four epupillate ocelli, two or three anterior ones small, and on the secondaries are six ocellate spots, consisting of a fuscous spot surrounded by a yellow line and having a white pupil; first spot distant, third small, fifth double; exterior margin with a yellow line.

Larva long, subcylindric, striate; head with two erect horns; body terminating in two porrected points.

Chrysalis short, thick, constricted across the abdomen.

North and West.

SAY.

2. **D. portlandia** *Fab.* Ent. Syst. III, 103. Figured in Boisd. et Lec. pl. 58.

Upper side pale livid brown, inclining to russety, with three large black eyes on the primaries and five on the secondaries. These eyes have no pupils and are surrounded with a yellow iris. Sometimes the primaries have a small intermediate eye between the first and second, and the secondaries have a sixth small anal eye.

The *under side* is paler than the upper, with a violet reflection, traversed by two brown sinuous rays, between which there is a discoidal arc of the same color. The eyes are neater and blacker than above, with the iris yellow; those of the primaries are inclosed in an oblong white ring, and the first is often pupilled with white; those of the secondaries are nearly all pupilled with white, the anal is double and the pupils oblong. Besides this, the eyes are preceded on all the wings by a white sinuous band, and followed by a line of the same color, which is double in the secondaries. The marginal edge is fulvous yellow. Antennæ yellowish; body of the color of the wings.

Larva feeds on grasses; green, with two white dorsal lines and a lateral band of the same color. The anal points are prominent, rosy white; head surmounted by two points of the same color, which are elevated in the form of ears; the under side of the abdomen and the feet are whitish-green.

Georgia.

BOISD.

COENONYMPHA Westwood.

Body small, wings entire, rounded, sometimes entirely destitute of ocellated spots; the three principal nerves of the primaries inflated at the base; fringe long, costal edge moderately arcuated; secondaries oval and triangular, fringe long, external edge convex and entire, internal edge usually emarginate towards the end; antennæ thin, not annulated with black, club ovoid, elongate; labial palpi much compressed, straight, hairy in front; head small, hairy, without a frontal tuft; eyes prominent, naked; abdomen moderately long, thin.

1. C. semidea *Say.* Amer. Ent. III, pl. 50.

Body black, immaculate; antennæ fuscous, beneath bright rufous toward the tip, the club very gradually formed; primaries brown, the costal margin with alternate black and white spots; beneath dull ochreous, with obsolete, transverse, abbreviated, blackish lines; costal and broad tip margin alternated with vivid black and white lines; secondaries dark brown; towards the posterior margin obscure ochreous, with obsolete abbreviated, blackish, transverse lines; posterior margin with a slender black line and dirty white edging; beneath marbled with black and white, the black prevailing across the middle and base of the wing.

White Mountains of New Hampshire.

Say.

2. C. galactina *Boisd.* Ann. Soc. Ent. 2me sér. X, 309.

Upper side white, a little yellowish; without any other spot than by the transparency of the other side.

Under side of the primaries with a small black eye at the summit, most frequently without a pupil, preceded from the side of the base by a ferruginous transverse line a little bent; that of the secondaries washed with gray, and this part more obscure is separated from the other by a sinuous ray, followed by one, two, three or four small black eyes, often without pupils.

California.

Boisd.

CALISTO Hübn.

The hairy eyes, the dilatation of the base of the costal and median veins of the primaries, the insertion of all the branches of the post-costal veins beyond the extremity of the discoidal veins, the strongly angulated middle disco-cellular vein and the *lobed secondaries*, distinguish this genus.

1. **C. zangis** *Fab.* E. S. III, 218. *C. agnes* Cram. Figured in Cram. pl. 325. Herbst, pl. 203.

Upper side brownish-black velvety, a little paler towards the tip; a small black eye with a yellow iris at the lobe of the secondaries.

Under side ferruginous, with four black transverse and undulated lines, of which two are between the base and the middle, the other two near the terminal edge.

Primaries, opposite the summit, have a large black eye, with a russety iris and a double white pupil.

Secondaries have two eyes, of which the anal one is like that on the upper side, the other similar to that of the primaries, but a little oblong and surmounted with three white points.

Body of the color of the wings.

Carolina.—Expands an inch and a half.

Encyc. Méth.

Fam. VIII. LYCAENIDAE.

Larva in the form of *Oniscus* (wood-louse.) *Chrysalis* short, obtuse at both ends. *Perfect insect;* abdominal edge embracing a little portion of the abdomen. Discoidal cellule closed apparently by a small nerviform prominence. Hooks of the tarsi very small.

ARGUS Linn.

Head smaller than the thorax; *palpi* bent; second article covered with short and thick-set hairs; the last article naked, thin and filiform; *antennæ* moniliform, terminated by fusiform club, compressed laterally at its extremity. The color of *Argus* is usually blue. The under side presents a number of small spots

or ocellated points, and often a marginal band of yellow spots. The females differ from the males in being often brown or blackish. *Wings* rounded, and ordinarily without tails. Some species have a small filiform process.

1. **A. filenus** *Poey.* Cent. *A. Hanno?* Hübn. *A. ubaldus* Godt. *A. pseudoptiletes* Boisd. Figured in Hübn. Exot. Samml. Cram. 390. L. M. Boisd. et Lec. pl. 35, p. 114.

Upper side of the male blue, with a slight black border; fringe whitish. In both sexes there is a small black round spot near the marginal edge of the secondaries.

Under side ash-gray, usually more pale in the male than in the female, with a discoidal crescent on the middle of each, and three sinuous, common bands, formed of small black spots circled with white, of which the posterior are a little less distinct and somewhat sagittate. The space which separates the internal band of the median is usually whiter than the rest, and forms a band of small white quadrangular spots. The base of the secondaries has a transverse row of three very black points, circled with white; of which the external is largest. The secondaries have on the marginal edge and near the anal angle, a black eye, more or less circled with yellow, sprinkled behind with golden-green atoms.

Southern States.—Expands three-fourths of an inch.

BOISD.

2. **A. pseudargiolus** *Boisd. et Lec.* Figured in Boisd. et Lec. pl. 36, p. 118.

Upper side of the male tender violet blue, with a slight black edge, often widened on the primaries. Fringe whitish and black.

Upper side of the female paler blue and less violet, a wide black border on the primaries, and a marginal row of black points; a small black arc at the extremity of the discoidal cellule.

Under side obscure gray, with a brown discoidal streak, a transverse sinuous line of black points a little circled with white, and a marginal row of brownish triangular crescents, each one supported by a point more obscure. At the base of the primaries, a transverse row of three distinct black points.

Larva green, pubescent; back yellowish; a median interrupted ray, cut transversely by a wide arc; oblique streaks on the sides; near the feet a marginal ray, dark green; head black.

Chrysalis reddish; wing envelopes greenish; back with four rows of obscure spots.

United States.—Expands an inch.

Boisd.

POLYOMMATUS Latr.

Palpi very straight; last article naked, rather long and subulate; *head* more narrow than the thorax; *antennæ* long, terminated by a fusiform elongated club; anal angle of the secondaries in most males a little prolonged; posterior edge usually somewhat emarginate before this angle, in the females.

Ground color of the wings more or less lively fulvous, at least in one of the sexes. The females always have some black points on the upper side.

1. **P. comyntas** *Godt.* Encyc. Méthod. IX, 660. Figured in Boisd. et Lec. pl. 36, p. 120.

Upper side of the male violet blue, posterior edge blackish.

Upper side of the female blackish-brown, sometimes uniform, sometimes with the base covered with bluish dust. Fringe white in both sexes; secondaries, with a marginal row of small round spots, of which one or two, near the filiform tail, are surmounted with a reddish arc.

Under side gray, with a central arc, then a flexuous line of small ocellate points, circled with white, and two marginal lines of small brownish spots. *Secondaries*, with a row of two or three basal black points, and two anal triangular crescents, reddish-yellow, with black ends, each supported on a very black point, but separated from it by a small arc of shining gold-green atoms.

Larva dirty greenish-white; an interrupted dorsal ray, and oblique lateral russety streaks; near the head, a transverse streak blackish, and near the tail, two greenish triangular spots. Head black.

Chrysalis yellowish; wing envelopes paler, and four dorsal rows of obscure points.

United States.—Expands a little over an inch.

Boisd.

2. **P. phlaeas** *Linn.* Syst. Nat. 793. Figured in most European authors.

Upper side of the primaries in both sexes shining fulvous, with the upper and side edge blackish-brown, and eight large black points.

Secondaries blackish-brown, with a central arc and some deeper points; then a fulvous crenated band, sometimes surmounted by a row of four or five blue points.

Under side of the primaries grayish-ash, with fifteen small scattered points, and a flexuous line.

Larva, which feeds on *Rumex*, is green, pubescent, with a rosy dorsal and marginal line, or sometimes pale green.

Chrysalis grayish, with obscure points on the back.

United States, Europe, Africa, &c.—Expands over an inch.

Boisd.

3. **P. hypophlaeas** *Boisd.* Ann. Soc. Ent. 2me sér. X, 293.

Closely resembles *P. phleas*, but is smaller, with the points more distinct, the wings more rounded; *under side* of the secondaries white-ashy, with the yellow marginal band strongly marked.

North of California and Northern United States.

Boisd.

4. **P. thoe** *Boisd. et Lec.* Figured in Guér. Règ. Anim. pl. 81. Boisd. et Lec. pl. 38, p. 125.

Upper side of the male brownish, with a violet reflection and a light blackish border; three black points, of which two are in the discoidal cellule.

Secondaries have on the terminal edge an orange fulvous band, crenated behind, and a blackish arc on the end of the discoidal cellule.

Upper side of the primaries of the female fulvous, with a blackish border, and some black discoidal points, of which two or three are in the cellule, and the others disposed in a transverse line. That of the secondaries brownish, with some scattered brownish points disposed nearly as on the primaries, and a fulvous marginal band as in the male, but paler.

Under side in both sexes the same. *Primaries* fulvous, with the posterior edge ashy, two or three sinuous rows of black points, and four similar points between the base of the wing and the internal row.

Under side of secondaries pale ashy, with a fulvous band as above; some black points circled with white, without order, towards the base, but regular towards the extremity. Fringe of secondaries white and black.

United States.—Expands over an inch.

Boisd.

5. **P. epixanthe** *Boisd. et Lec.* Figured in Boisd. et Lec. pl. 38, p. 127.

Upper side brownish-black, with scattered black points. Primaries with the costal edge a little reddish; secondaries with a narrow marginal fulvous band, crenated behind. Fringe grayish.

Under side yellowish; primaries, with about fifteen black points disposed as in the analogous species; secondaries, with black points, but small; a crenated band of a more lively tint than that on the upper side.

Western States.—Expands about an inch.

Boisd.

6. **P. crataegi** *Boisd. et Lec.* *P. tarquinius* Fab. Figured in Boisd. et Lec. pl. 37, p. 128.

Wings, blackish-brown; primaries, with a longitudinal sinuous yellow band, irregular at its extremity, and marked towards the base by a blackish interrupted line.

Secondaries, with the lower limb bright yellow, and a marginal series of black points.

Primaries of the female yellowish, with a crenate black border and two longitudinal interrupted black bands, the anterior the longer, and divided into three parts. *Secondaries* with the extremity yellowish, and four to six black points disposed in two rows.

The *under side* is reddish-yellow, glossed with whitish, with deeper spots slightly circled with white on the secondaries; primaries, with all the disk, of a yellowish tint.

Larva, which feeds on *Crataegus*, is green, with three dorsal white rays, and one at the base of the feet.

Chrysalis grayish; back darker, marked with prominent tubercles. Hind extremity pointed and a little arcuate.

United States.—Expands an inch and a half.

Boisd.

7. P. helloides *Boisd.* Ann. Soc. Ent. 2me sér. X, 292.

Upper side smoky yellow, with a beautiful violet reflection in the male. Markings nearly as in *P. phleas*, except that the latter has only one black point towards the base of the primaries, whilst this species has two.

Under side of primaries nearly similar to *P. phleas;* that of the secondaries reddish-gray, with a row of marginal lunules bright ferruginous.

San Francisco.

Boisd.

8. P. gorgon *Boisd.* Ann. Soc. Ent. 2me sér. X, 292.

Upper side with a bright violet reflection, a small black border, and the fringe intersected with white; primaries with a small subcostal black point; secondaries with a fulvous anal streak.

Upper side of the female dull brown, spotted with fulvous, as in the allied species, but of a paler tint.

Under side of both sexes russety on the primaries, pale grayish on the secondaries, with a great number of ocellate black points on each wing, and a row of fulvous marginal spots on the secondaries.

Mountains of California.

Boisd.

9. P. xanthoides *Boisd.* Ann. Soc. Ent. 2me sér. X, 292.

Size and general appearance of *P. gorgon.*

Under side of the male pale ashy-brown, rather glossy, with a black edge and white fringe slightly cut by the black of the nerves. Primaries with a small subcostal black streak, preceded by a small point of the same color; secondaries with a fulvous marginal streak towards the anal angle, and marked with two or three marginal black points in a line, and united with the border.

Under side russety gray, with a great number of black points; that of the secondaries with two or three fulvous lunules towards the anal angle, preceded by a ray paler than the general tint.

Mountains of California. Rare.

Boisd.

10. P. arota *Boisd.* Ann. Soc. Ent. 2me sér. X, 293.

Upper side of the male brown, with a glossy red reflection, and some small points which are transparent from the opposite surface;

anal angle of secondaries with two small black marginal points, one on each side of the tail.

Upper side of the female brown, with the disk of the primaries and the greater part of the secondaries fulvous, spotted with black.

Under side of the primaries fulvous, the extremity ashy, with a great number of ocellate black points.

Under side of secondaries ashy, with smaller points and less distinct, a whitish band, terminal, sinuous within, deeper towards the fringe, and marked on each side of the tail with a black point. Distinguished from the allied species by the small tail.

California.

Boisd.

11. P. amyntula *Boisd.* Ann. Soc. Ent. 2me sér. X, 294.

Very similar to *P. comyntas*, of which it may be only a variety. It differs from it in the male not having fulvous lunules on the upper side, and in the under side of both sexes being more white, with smaller points; and finally, in having only the anal lunule powdered with golden atoms.

California.

Boisd.

12. P. exilis *Boisd.* Ann. Soc. Ent. 2me sér. X, 295.

The smallest species known.

Upper side clear brown; secondaries paler, with a blackish border.

Under side of primaries very clear brown, with white interrupted transverse striæ, more or less distinct.

Under side of secondaries white, with brown striæ and a marginal row of seven black ocelli powdered with golden atoms.

California.

Boisd.

13. P. antaegon *Boisd.* Ann. Soc. Ent. 2me sér. X, 295. *P. acmon?* Westw. and Hewits. Gen. Diurn. Lep. pl. 76, fig. 1.

Upper side beautiful violet blue, with a small blackish border and white fringe; inferiors with ante-marginal border fulvous, resting on a series of black points.

Under side ash-gray, with a great number of distinct and neat black points. That of the secondaries has before the border a fulvous interrupted band, resting on a row of black ocelli, pow-

dered with very brilliant golden atoms; a black point between the base and the discoidal spot of the primaries. The female is sometimes all blue, sometimes only at the base, and sometimes nearly black. In every case the band of the upper side of the secondaries is always more distinct than in the male.

California.

Boisd.

14. P. xerces *Boisd.* Ann. Soc. Ent. 2me sér. X, 296.

Upper side of the male, blue; that of the female brown, with some blue atoms at the base, without any other spot.

Under side of both sexes dark gray, with a central spot and a sinuous interrupted band, formed of large white points; no marginal lunules.

California.

15. P. saepiolus *Boisd.* Ann. Soc. Ent. 2me sér. X, 297.

Upper side blue, with a black border, wide on the primaries, more narrow on the secondaries, the primaries having besides a black costal point. Female entirely black, or powdered with blue at the base.

Under side ash-gray in the male, dark gray in the female, with a great number of black points as in the analogous species; that of the secondaries with three or four fulvous marginal lunules, more distinct in the female.

Mountains of California.

16. P. icarioides *Boisd.* Ann. Soc. Ent. 2me sér. X, 297.

Upper side violet blue, with a small black border and white fringe. That of the secondaries with the border interrupted, forming a series of marginal black points.

Under side clear and white; that of the primaries with a discoidal lunule and a transverse sinuous line formed of black ocellate spots; that of the secondaries with a central lunule and two sinuous rows of white points scarcely pupilled with black. Female brown, with the under side rather dark brownish-gray, marked with a central lunule and two rows of distinct ocellate black points.

Mountains of California.

17. **P. pheres** *Boisd.* Ann. Soc. Ent. 2me sér. X, 297.

Upper side violet blue. *Under side* ashy-white; that of the primaries with a small discoidal cellule and a sinuous line of ocellate black points; that of the secondaries with white spots not ocellate. Female brown, with the base more or less bluish.

San Francisco.

18. **P. heteronea** *Boisd.* Ann. Soc. Ent. 2me sér. X, 297.

Upper side violet blue, with a small blackish edge, white fringe, and very prominent nerves.

Under side ashy-white; that of the primaries with a point and central lunule black, followed by two parallel sinuous lines of black points.

Under side of secondaries with two parallel rows of small obsolete spots, whitish-gray, little distinct from the ground color.

Upper side of the female brown, with the disk more or less fulvous, pointed with black, and traversed by a sinuous line of large black points. *Under side* like that of the male.

Mountains of Northern California.

19. **P. enoptes** *Boisd.* Ann. Soc. Ent. 2me sér. X, 298.

Upper side violet blue, with a rather wide black border; the fringe intersected with white and black on the primaries only, entirely whitish on the secondaries.

Under side ashy-white, with a great number of black ocellate points; the two striæ of posterior points are separated on the secondaries by a series of five yellow lunules.

California.

Boisd.

20. **P. piasus** *Boisd.* Ann. Soc. Ent. 2me sér, X, 299.

Upper side blue, fringe whitish; that of the female with a blackish border on all the wings.

Under side of both sexes ashy-white, with a multitude of black ocellate points disposed as in the analogous species. Those of the posterior row are followed by one of clear white, which forms a transverse band, and occupies the whole space between it and the crescents of the extremity, which are nearly effaced, and resting

behind on a grayish marginal band, crenate, more obscure than the ground color.

California.

BOISD.

21. P. antiacis *Boisd.* Ann. Soc. Ent. 2me sér. X, 300.

Upper side violet blue, with a slender black margin and whitish fringe.

Under side ash-gray, with the base greenish-blue; a transverse line of black points strongly ocellate with white, near the extremity, preceded on the primaries by a central lunule and on the secondaries by a central lunule and two ocellate points. Female blackish above, with the base more or less bluish.

San Francisco.

BOISD.

22. P. dorcas *Kirby.* Faun. Bor. IV, 299. Figured in Kirby Faun. Bor. Amer. IV, pl. 4, fig. 1.

Body black above, white below. Antennæ black, with white rings. Knob tipped with orange; wings brown, with a reddish tint, underneath tawny; primaries with an angular band, formed by faint black spots; behind these nearer the costa is a black bar, above which are two more spots; between the band and the posterior margin are three more black spots, arranged transversely, and above the base are three more black spots forming a triangle; the secondaries have a slight sinus near the anal angle, the fringe of which projects so as to assume the appearance of a short tail; across the disk runs an angular band formed of faint black spots, above which is a crescent of the same color; at the anal angle is an orange-colored angular bar, or abbreviated band; underneath, these wings have several indistinct black dots, the three external ones of which form an obtuse angle with the four internal ones.

"This species seems to be the American representation of *P. phlæas*, but its color is much less vivid."

Canada.

KIRBY.

23. P. lucia *Kirby.* Faun. Bor. IV, 299. Figured in Kirby Faun. Amer. Bor. IV, pl. 3, fig. 8, 9.

Wings above silvery blue, terminating, especially at the posterior margin, in a very slender black line; fringe white, barred

with black; primaries underneath ash-colored, mottled with white; in the disk is a black crescent and a curved macular band, consisting of mostly oblique black crescents edged with white, especially on their under side. The wing terminates posteriorly in a broadish brown band, formed chiefly by obsolete eyelets; secondaries brown, underneath spotted and striped with black and white; towards the posterior margin the white spots are arranged in a transverse band parallel with it, and as in the primaries; the wing terminates in several obsolete eyelets.

Canada.—Expands one inch.

KIRBY.

24. P. americana *Harris MS.*

The fore wings on the *upper side* are coppery-red, with about eight small square black spots, and the hind margin broadly bordered with dusky-brown; the hind wings are dusky-brown, with a few small black spots on the middle, and a broad coppery-red band on the hind margin. The wings expand from $1\frac{1}{10}$ to $1\frac{1}{5}$ inch. The caterpillar is long oval, and slightly convex above, and of a greenish color; it probably lives like the *P. phleas*, on the leaves of dock and sorrel. The *chrysalis*, which is usually suspended under a stone, is light yellowish-brown and spotted with black dots.

Massachusetts.

HARRIS.

THECLA FAB.

Palpi nearly straight, sometimes longer than the head; last article naked, rather long, subulate or a little acicular; *head* more narrow than the thorax; *eyes* rather prominent; *antennæ* of moderate length, terminated by a club usually elongate and sometimes nearly fusiform; *secondaries prolonged in one or more thin tails*, sometimes but rarely simply dentate.

1. T. halesus *Fab.* Syst. emend. III, 273. *T. dolichos* Hübn. Figured in Cram. 98. Herbst, pl. 295. Hübn. Zutr. 219. Boisd. et Lec. pl. 25, p. 83.

Upper side of the males, beautiful glossy blue. *Primaries* have at the extremity a black border of moderate width. *Secondaries*

terminated by two black tails, of which the external one is much shorter. At the external angle, near the summit, there is a wide black border, which does not reach the anal angle. The latter is extended somewhat in the form of a spatule, powdered on both sides with golden atoms, which extend to the base of the tails.

The *upper side* of the females is pale greenish-blue, and this color extends scarcely beyond the middle of the wings; spatule and base of the tails, as in the males.

Under side of all the wings in both sexes is brownish-black, with three red spots, of which one is at the base of the primaries, and the two others at the base of the secondaries. The latter have besides, towards the anal angle, a macular ray of golden green, followed by several white spots, powdered with some golden atoms. The males often have along the edge of the superiors, a blue ray, more or less distinct.

Body and *thorax* above of the color of the wings.

Abdomen red below and on the sides, and in some specimens this color extends to the back.

Under side of the breast black, with some white points which extend to the base of the primaries.

Head pointed with white; *antennæ* black, with the club more fusiform than in most of the species of this genus.

Larva, which feeds on *Quercus*, green, slightly pubescent. Head and scaly feet testaceous. On the back, there is a small ray, and on the sides nine oblique bands of obscure green. At the base of the feet, a marginal ray of greenish-yellow.

Chrysalis russety, pointed with brown.

Southern States.—Expands an inch and a half.

Boisd.

2. **T. M-album** *Boisd. et Lec.* Figured in Boisd. et Lec. pl. 26, p. 86.

A size smaller than *T. halesus*. *Upper side* of the male blue, a little violet, with a wide black border commencing at the base of the primaries and extending nearly all round.

The *upper side* of the female is a little more pale, and the black border is usually wider.

In both sexes, the secondaries are furnished with two small black tails, of which the external one is shorter.

The *under side* of the wings is cinereous; that of the primaries is traversed towards the middle by a small white ray which begins

on the upper edge and ends on the median nervure. The secondaries have beyond the middle a whitish line, straight in its first half, angular towards the anal angle, where it describes a kind of M, and then continuing to the side. Between this line and the outer edge there is another line, less distinct, shaded outwardly with blackish, interrupted by a red spot, situated in the space between the two tails. The anal angle has a black spatule, separated from the internal tail by a square pale blue spot. At the base of the tails there is a small white or grayish line which separates the fringe, which is also white in this part of the wings. The base of the upper edge of the primaries is reddish, and the middle of the secondaries, near the upper edge, is marked with a whitish point.

Body, bluish above; ashy gray below.

Antennæ blackish, annulate with white; club blackish, tipped with fulvous.

In some specimens there is a small red spot on the spatule of the anal angle.

Larva slightly pubescent, pale green, a little yellowish, with a dorsal ray and seven oblique streaks, green.

Head black; marginal ray yellow, slightly shaded with obscure green on its upper side. Feeds on *Quercus*.

Chrysalis brownish-gray, with the anterior part and envelope of the wings pale gray, a little greenish.

Southern States.

BOISD.

3. T. psyche *Boisd. et Lec.* p. 88. Figured in Boisd. et Lec. pl. 27.

Same size as *T. M-album*, and most probably a mere variety. The four wings glossy blue, a little violet, with a wide black border as in *T. M-album*. The primaries sometimes have the costal margin a little reddish at the origin.

Secondaries with two tails; generally a small red spot at the anal angle; sometimes a small white spot on the disk of the primaries, in the male.

Under side dark, cinereous. Primaries traversed in the upper half by two whitish rays, meeting at their lower extremity. Secondaries traversed to the middle by a white ray describing a sort of M. Between this ray and the external edge there is another, which is interrupted between the two tails by a red spot. Near

the larger tail there is a bluish space, bordered interiorly with black.

Southern States.

BOISD.

4. **T. hyperici** *Boisd. et Lec.* p. 90. *T. favonius?* Boisd. Figured in Boisd. et Lec. pl. 28.

Probably a variety of *T. favonius*. *Upper side* blackish-brown, uniform in the female, a more obscure tint in the disk of the male, forming a sort of indistinct spot.

The *secondaries* have two tails, of which the internal is the longer. They are preceded by one or two fulvous crescents, supported by a black spot, separated from the fringe by a pale bluish-gray ray. The edge of the anal spatule is also a little bordered with fulvous.

The *under side* of the wings is ash-gray. The *primaries* are traversed in their posterior half by two rather wavy rays, of which the anterior one is white, bordered with reddish-brown, and the other brown, feebly lined with whitish.

The *secondaries* are traversed by two white rays, shaded with brown before. The anterior one is angular towards the anal angle, and the other is interrupted between the two tails by a fulvous spot, marked with black behind. The anal spatule is more widely fulvous than above, and between this and the other fulvous spot there is a space of pale blue. Besides these, the four wings have at the origin of the fringe a small brownish line more or less apparent, and the costal edge is a little marked with fulvous at its origin.

Body like the wings; lower side of the head and the extremity of the abdomen of the female a little fulvous. *Antennæ* blackish, with white rings; club tipped with reddish. Breast and under side of abdomen white.

Larva above reddish, with three brown rays, of which one is on the back. Lower side of abdomen, head and feet, green. Feeds on *Hypericum*.

Chrysalis yellowish, with the rings of the abdomen a little violet, marked with four rows of black points.

Southern States.—Expands a little over an inch.

BOISD.

5. **T. falacer** *Godt.* Encyc. Méthod. IX, 633. *T. calanus* Hübn. Figured in Boisd. et Lec. pl. 29, p. 92.

Upper side uniform brownish-black. Primaries with a small, oval, grayish shining spot on the disk of the males. Secondaries terminated by two small tails, a little whitish at the extremity, of which the internal one is much the longer. At the base of these tails, near the fringe, there is a small grayish-white line, sometimes preceded by an indistinct fulvous spot.

Under side ashy brown, with a short, geminate, bluish ray on the disk of each wing. The primaries are traversed by two small rays of bluish-white, shaded with brown on one of their sides, of which the exterior is indistinct. The secondaries are traversed by two similar rays which form an angle towards the abdominal edge. Between the tails there is a fulvous spot, bordered with black on the outer side, followed by one or two small spots of the same color—an ashy blue space, bordered with a black spatule. The anal emargination is also bordered with fulvous; a small white marginal line at the fringe.

Body, like the wings; breast, with some bluish hairs; abdomen whitish. *Antennæ* blackish, with white rings; club blackish.

Larva, which feeds on *Crataegus*, pale russety; a little greenish on the sides, which are marked with oblique brown streaks; a wide brown band on the back, which disappears on the middle rings, where it is replaced by two parallel brown lines; the brown band reappears on the posterior rings.

Chrysalis yellowish-brown, powdered with brown atoms.

Southern States.—Expands a little over an inch.

Boisd.

6. **T. favonius?** *Godt.* Encyc. Méthod. IX, 635. *T. melinus?* Hübn. *T. humuli* Har. Figured in Sm. Abb. pl. 14. Boisd. et Lec. pl. 30.

Form and size of *T. falacer*. "*Upper side* dusky brown, with a tint of blue gray; and in the males there is an oval darker spot near the front edge; the secondaries have two short thread-like tails, the inner one the longer and tipped with white; along the hind margin of these same wings is a row of little pale blue spots, interrupted by a large orange-red crescent, inclosing a small black spot; *under side* slate gray, with two wavy streaks of brown, edged on one side with white; and on the secondaries an orange-

colored spot near the hind angle, and a larger spot of the same color inclosing a black dot just before the tails. It expands one inch and one-tenth." *Larva* feeds on *Humulus* (Hop).

HARRIS, INS. MASS., p. 217, ed. 1842.[1]

7. **T. liparops** *Boisd. et Lec.* p. 99. *T. favonius* Sm. Abb. Figured in Boisd. et Lec. pl. 31.

Form and size of *T. falacer*. *Upper side* clear brown; on the disk of the primaries a fulvous, oblong spot, transversely disposed and mingling more or less with the ground color. In the female? this fulvous space is preceded by a small black spot.

Secondaries terminated by two tails, of which the internal is the longer. Between these tails, usually a fulvous spot in the female. In both sexes, there is a small black spot at the base of each tail, separated from the fringe by a whitish or bluish ray. The anal spatule is also marked by a blackish spot surmounted with a little white.

Under side pale ash-gray; primaries traversed by four white lines, more or less distinct, after uniting towards the lower edge. Between these lines and the outer edge there is another sinuous white line. Secondaries traversed by two double rays, of which the anterior form a sharp angle below. Behind these rays, there is a fulvous macular band, formed of from three to six spots, bordered slightly with black. Anal spatule is marked with a little black, and between it and the long tail there is a bluish space.

Under side of the body like the wings. Breast, abdomen below, and feet grayish-white. Antennæ black, with white rings; club tipped with fulvous.

Larva yellowish-green, with a dorsal line and eight oblique streaks of dark green. Marginal ray green, yellow below.

[1] There is an almost inextricable confusion in the determination of these species. *T. humulus* Harr. has been mistaken for *T. favonius* Sm. Abb., but is different. Boisd. has figured this species as *F. favonius* in Boisd. et Lec. pl. 30, but he is doubtful himself of its correctness. He says, "I am by no means certain that Abbot's *Favonius* is the same as the one I give. . . . . After having carefully examined my specimens and attentively compared them with the original drawings and notes of Abbot, I have come to the conclusion that my *Hyperici* is the same as my *Favonius* . . . . and that *T. liparops* is the true *Favonius*."

Chrysalis ash-gray, with two rows of blackish points on each side of the abdominal rings.

Southern States.

BOISD.

8. **T. iris** *Godt.* Encyc. Méthod. IX, 674. Figured in Boisd. et Lec. pl. 31, p. 101.

Upper side of the male blackish-brown, with a small grayish ovoid spot near the costal edge; the female is deeper brown, with the extremity more or less russety.

Wings denticulate; fringe whitish.

Under side brown, with a white transverse line, sinuous. Extremity of the wings a little russety, divided by an indistinct ray, divided by the nervures. The extremity of the secondaries are powdered with ash-gray, and divided by a transverse interrupted line of brown purple, often marked by one or two small brown spots. The base is slightly powdered with gray, and separated from the tint of the middle by a wavy transverse line.

Larva, which feeds on *Vaccinium*, is yellowish-green, with two dorsal interrupted rays; one lateral ray and eight oblique streaks pale green.

Chrysalis ferruginous, pubescent; two longitudinal obscure rays.

Georgia.—Expands an inch and an eighth.

GODART.

9. **T. arsace** *Boisd. et Lec.* Figured in Boisd. et Lec. pl. 32, p. 103.

Same size as *T. iris*, and in some respects similar.

Upper side of the male brownish-black, with a small ovoid spot near the costal edge; the female is deeper brown, with the extremity reddish-yellow, forming on the primaries a large spot mingling with the ground color, and on the secondaries a smaller spot situated near the anal angle. *Wings* denticulate as in *T. iris*.

Under side brown, traversed in the middle by a sinuous brown line; extremity of the primaries paler, divided by two transverse rays more obscure and indistinct; extremity of the secondaries is powdered with gray as in *T. iris*, divided by a row of indistinct brownish spots, and forming nearly a curved ray.

Larva reddish; back white from the second to the ninth ring, and divided by two parallel interrupted lines of obscure green. Near the base of the feet, there is a marginal ray of the same color,

bordered with white below, and between that and the dorsal rays a row of seven or eight oblique streaks.

Chrysalis reddish before, and the wing envelopes greenish.

Southern States.

BOISD.

10. **T. niphon** *Hübn.* Figured in Hübn. Zutr. fig. 203. Boisd. et Lec. pl. 33, p. 105.

Size, color, and *upper side* markings of *T. iris* and *T. arsace.*

Under side rather clear russety brown; the discoidal cellule of the primaries has two black transverse streaks, and beyond the middle a black sinuous ray edged with white, followed by a row of black sagittate spots, uniting in a curved wavy line, separated from the fringe by small grayish spaces. The secondaries are traversed by two tortuous black rays, of which the one towards the base is edged with white within and the other with white without, and connecting with the ray of the primaries. Between these two rays there is a black streak, and the outer one is followed by an angular black ray, of which the posterior concavity is filled by a pale tint, which separates it from a marginal purple line, more or less mingling near the fringe, with an ashy tint.

Larva green, pubescent, with three longitudinal rays on the back, the middle one pale yellow, the other two white. Near the feet, usually a small marginal white line. Head brown. Feeds on *Pinus.*

Chrysalis grayish, with four rows of small spots, of which the two middle ones are blackish and indistinct, and the others ferruginous.

Georgia and Florida.

BOISD.

11. **T. smilacis** *Boisd.* Figured in Boisd. et Lec. pl. 33, p. 107.

Upper side blackish-brown, with a pale whitish spot near the middle of the costal edge; the secondaries have two thin tails, as in the analogous species.

Under side greenish, often washed with a little reddish, with a transverse whitish ray sinuous on the primaries, tortuous on the secondaries, bordered in front by a ferruginous tint. Between this ray and the base, the secondaries have another short transverse sinuous ray of the same color. The extremity is marked by two or three ashy crescents, of which the intermediary is black in front,

and the third in a line with two or three small ferruginous spots, more or less distinct. The anal palette is black, and near the fringe there is a small white marginal line.

Larva, which feeds on *Smilax*, is green, with the head and feet blackish. It has four rows of red spots, of which the two dorsal are formed of smaller spots, and one on each side composed of spots somewhat larger.

Chrysalis grayish-brown, with the abdomen more clear and reddish.

BOISD.

12. T. sylvinus *Boisd.* Ann. Soc. Ent. 2me sér. X, 287.

Upper side brownish-black in both sexes, with a stigma on the primaries of the male, and one or two fulvous spots near the anal angle of the secondaries of the female.

Under side pale ashy, with a small discoidal spot on each wing, and two sinuous striæ of points of the same color towards the extremity; the anal angle of the secondaries with a space of bluish ashy, preceded before the tail by a yellow lunule supported by a black point.

California.

BOISD.

13. T. auretorum *Boisd.* Ann. Soc. Ent. 2me sér. X, 287.

Upper side blackish-brown, with a stigma on the primaries and two obsolete fulvous spots towards the anal angle of the secondaries. *Under side* brown, with two wavy rays on the secondaries, blackish, indistinct, of which the posterior is nearly marginal and supported in two small fulvous crescents; edge of the anal angle black.

California.

BOISD.

14. T. saepium *Boisd.* Ann. Soc. Ent. 2me sér. X, 287.

Upper side reddish-brown, without spots, in both sexes; the male with a stigma on the primaries. *Under side* brown, a little more pale towards the extremity, traversed a little beyond the middle by a small white line, wavy, and near the extremity by a line more obscure, obsolete, equally sinuous, blending towards the anal angle of the secondaries into a grayish-blue space preceded by a small black crescent.

California.

BOISD.

15. T. grunus *Boisd.* Ann. Soc. Ent. 2me sér. X, 289.

Female; *upper side* brown, with the disk obscure fulvous, especially on the secondaries. *Under side* pale yellowish, traversed a little beyond the middle by an indistinct ferruginous line. On the right and left of the tail there is a small fulvous crescent, surmounted by a blackish arc.

California.

Boisd.

16. T. iroides *Boisd.* Ann. Soc. Ent. 2me. sér. X, 289.

Upper side brown, without spots in the male, the disk a little ferruginous in the female, and angle of the secondaries deeply emarginate. *Under side* brown. *Under side* of secondaries ferruginous brown, sometimes a little vinous, with the base widely obscure, and the extremity with a row of blackish points, more or less distinct.

California.

Boisd.

17. T. eriphon *Boisd.* Ann. Soc. Ent. 2me sér. X, 289.

Upper side brown, with the disk more or less marked with ferruginous. *Under side* paler brown; that of the primaries with a small central point, an undulated ray, edged with white and marginal sagittate spots, blackish; that of the secondaries washed with vinous red, and traversed by three black rays profoundly sinuous, edged with white, of which the posterior is serrate, forming sagittate spots.

California. Rare.

Boisd.

18. T. dumetorum *Boisd.* Ann. Soc. Ent. 2me sér. X, 291.

Wings olive brown, without spots; anal palette of the secondaries nearly obsolete. *Under side* of primaries russety, a little greenish; that of the inferiors greenish, with a transverse row of small white points.

California.

Boisd.

19. T. damastus *Godt.* Encyc. Méthod. IX, 640. *T. damon* Cram. Figured in Cram. pl. 390, fig. C. D.

Upper side blackish-brown, with the disk fulvous.

Under side green, with two black bent lines, and bordered with white to the extremities of the primaries; with three similar lines, but flexuous, on the surface of the secondaries. The anal angle of secondaries has a suite of three small ocelli with a white iris.

Virginia.—Expands scarcely half an inch.

GODART.

20. T. acis *Drury.* *T. mars* Fabr. *T. ixion* Fabr. Figured in Drury, I, pl. 1, fig. 2.

Upper side. Primaries entirely dark brown, without any marks or spots. Secondaries the same, with four tails, the inner ones much longer than the others; close above which latter are two red spots, edged at the bottom with black, and two more placed at the anal angle. The ciliæ white.

Under side. All the wings of a dark lead color. A very narrow black and white line crosses the primaries, parallel to the external edges; another indented irregular line crosses the secondaries, beginning near the middle of the anterior edge, and meeting just below the extremity of the body. Four long reddish spots are very visible on this side, below which are four black ones.

Jamaica.—Drury gives New York as its habitat. Doubtful.

21. T. strigosa *Harr. MS.*

"The streaked *Thecla* has a long and a short tail on each of the hind wings, and is of a dark brown color, without spots on the *upper side;* the wings beneath are ornamented with wavy transverse white streaks, and near the hind margin of the posterior wings is a row of deep orange-colored crescents, with a large blue spot near the hindmost angle. It measures $1\frac{1}{10}$ inches across the wings. In the markings of the *under side* of the wings it nearly resembles *T. liparops.*"

Massachusetts.

HARRIS MS.

22. T. aubumiana *Harris MS.*

The outermost of the tails is very short, and often nothing remains of it but a little tooth on the edge of the wing. It varies considerably in color; the females are generally deep brown above, but sometimes the wings are rust-colored or tawny in the middle, as they always are in the males; the oval opaque spot which

characterizes the latter sex is ochre yellow. Upon the *under side*, the wings in both sexes are green, the anterior pair tinged with brown from the middle to the inner edge; externally, next to the fringe, they are all margined by a narrow wavy white line, bordered internally with brown; at some distance from the posterior margin is another broader white line, or series of contiguous spots, bordered internally with brown; this line, on the fore wings, does not reach the inner margin; on the hind wings it consists of six spots arranged in a zigzag manner, and the last spot, next to the inner margin, is remote from the rest; besides these, there are on the same wings three more white spots bordered with brown, between the zigzag band and the base; and between the same band and the margin three black spots, behind the middle one of which is a rust-red spot with a black centre. The wings expand from $1\frac{1}{20}$ to $1\frac{1}{10}$ inch. This pretty species is found on the mouse-ear (*Gnaphalium plantagineum*) in May, and on the flowers of the spearmint in August.

Massachusetts.

HARRIS MS.

23. **T. mopsus** *Hübn.* Figured in Hübn. Zutr. fig. 135. Boisd. et Lec. pl. 34, p. 109.

Upper side of the male blackish-brown, with the usual ovoid spot on the costal edge. The female is more dull, without the costal spot, but with one or two yellow lunulate spots towards the anal angle of each wing. The secondaries are without tails.

Under side of the male is grayish-brown, traversed by a row of black points circled with white, followed on the secondaries by a marginal band of reddish and somewhat macular, and on the primaries by a second row of black points lightly circled with white.

Under side of the female is a little more clear. The series of ocellated spots is preceded in the secondaries by a discoidal black streak circled with white; the red marginal band is more sensibly edged with white in front, and continues a little on the primaries, where it replaces the second row of black points on the male.

Larva, which feeds on *Eupatorium celestinum*, is greenish, with the back a little more whitish. The anterior and dorsal part has a brownish quadrangular space, bifid behind, and marked with four white spots. The three hind rings have a wide white border, edged with brown. Head and feet brownish.

Chrysalis resembles that of *Smilacis*, but differs in having on each side a row of yellow ferruginous points.

Southern States.—Expands an inch and a half.

BOISD.

24. T. poeas *Hübn.* *T. beon* Godt. Figured in Boisd. et Lec. pl. 35, p. 109.

Upper side blackish-brown, with the base of the primaries and the extremity, or even the whole of the secondaries, pale blue. Some specimens have the base of the primaries entirely blackish, and sometimes even all the wings, without any traces of the blue. The secondaries have tails, white at the summit. Some, which have the extremity blue, have a row of small marginal, unequal lunules, blackish-brown.

Under side is russety gray.

Southern States.

BOISD.

25. T. augustus *Kirby.* Faun. Bor. IV, 298. Figured in Kirby, Faun. Bor. Amer. IV, pl. 3.

Antennæ annulated with white; knob elongated; wings dusky black, with a dull ferruginous disk; fringe alternately white and black; secondaries underneath black at the base; at the apex dusky ash-colored, with a transverse series of about eight black spots, rudiments of which appear on the lower surface of the primaries.

Canada.—Expands one inch.

KIRBY.

FAM. IX. ERYCINIDAE.

Larva very short, pubescent or hairy. *Chrysalis* short, contracted. *Perfect insect;* nearly constantly six feet in the females and four in the male. Abdominal edge of the secondaries not prominent. Discoidal cellule sometimes open, sometimes closed, and sometimes closed apparently by a false nervure. Hooks of the tarsi extremely small.

NYMPHIDIA FAB. *Erycina* Latr.

Head of the width of the thorax; *antennæ* long, annulate with whitish, terminated by a small elongated club; *palpi* short,

straight, scarcely extending beyond the eyes; thorax slender, rather long; abdomen a little shorter than the secondaries; the four wings rounded; discoidal cellule of the secondaries open; six feet in the female, four in the male.

1. **N. pumila** Boisd. Figured in Boisd. et Lec. pl. 37, p. 131.

Upper side reddish ferruginous, with wavy, blackish, flexuous lines, nearly macular. Besides these black lines, the extremity has two others of a black lead color, separated by a row of black points, of which the internal one is strongly sinuous. *Under side* fulvous yellow, with the transverse lines more macular. Body above ferruginous, below yellowish.

Georgia—Florida.

Boisd.

LEMONIAS Ill.

Head hairy; eyes naked. Antennæ rather long, slender; club long, slender. Primaries more or less triangular; costal margin nearly straight; apical angle subacute, post-costal vein with only three branches. Secondaries subovate; post-costal curved at its base, forked at a moderate distance from the base. Fore legs of the males very small, densely clothed with soft silky hairs; fore legs of the females longer, slender, scaly; tarsus armed beneath with some short spines at the tips of the joints. Four hind legs long, slender, scaly. Tibiæ not armed beneath with spines. Nails and appendages minute.

1. **L. mormo** *Felder.* Wiener Entom. Monatschrift, III, No. 9, 271.

Wings subrepand; ciliæ widely intersected with white, above obscurely fuscous, beneath paler. *Primaries* on both sides ferruginous fulvous from the base to the disk, with two basal points, a third larger, internal, a discal spot, a macular band, sinuate and seven points, submarginal, surrounded with black and white, the disk paler and the submarginal points much larger, elongate, spotted with black, veins fulvous.

Secondaries a little fulvescent above the base, with two points, marked with white; two discal spots, one larger, the external band macular, much interrupted, repand, minute white spots surrounded

with white, beneath much paler; costa white at the base, the spots and points of the upper surface, but much larger and nearly confluent. *Antennæ* annulated with white. *Thorax* and abdomen black above, below with the palpi and feet whitish.

Utah.

FELDER.

FAM. X. HESPERIDAE.

Larva cylindric, without spines; first ring small, head prominent. *Chrysalis* cylindroid, elongate, hardly angular. *Perfect insect;* head wide, transverse. Antennæ often terminated by a hook. Palpi short, last article very small.

HESPERIA LINN.

Head broad; body robust. Labial palpi compressed in front and incurved, with the sides convex and angulated. Antennæ of moderate length or elongate, straight, slender, with a subterminal club, tip hooked. Primaries elongated triangular; apical margin, more or less convex; costal margin not reflexed, and the disk in the males not marked with the oblique silky patch; often marked with pellucid spots. Secondaries subtriangular, with the outer and anal angles rounded, or with the outer margin rounded and sometimes dentated. Anal angle not produced into a prominent lobe or short tail, and the disk beneath not marked with silvery spots.

1. H. cellus *Boisd.* Figured in Boisd. et Lec. pl. 73.

Wings brown; primaries with a broad yellow band across the middle, the top of which is whitish; a whitish spot at the upper edge. Secondaries without spots on the disk. Fringe dull yellow or greenish, more distinct on the upper angle of the secondaries. *Under side* paler; markings of primaries the same, except that lower edge is yellow. Secondaries with two bands of deep brown.

United States.—Expands two inches.

BOISD.

2. **H. lycidas** *Godt.* Encyc. Méthod. IV, 751. Figured in Boisd. et Lec. pl. 71.

Wings deep brown, a little yellowish near the base; primaries with four or five yellow spots, forming a short irregular band; between this band and the summit are two or three points of the same color. Secondaries without spots.

Under side of primaries with a yellow band, narrow at the costal edge, widening downwards but not reaching to the lower edge; beyond this, is an interrupted line of yellow spots and a pale purple streak.

Under side of secondaries ash-gray, a large silvery spot on the outer edge, surmounted by two points of the same color: fringe white and brown.

United States.—Expands two inches.

BOISD.

3. **H. proteus** *Godt.* Encyc. Méthod. IX, 730. Figured in Boisd. et Lec. pl. 69. Sm. Abb. I, pl. 39. Cram. pap. pl. 260. Clerck, Icon. Ins. pl. 42.

Wings brown; light green at the base of the primaries, and covering half of the secondaries. Primaries, with four or five white spots oblong or square, and an arcuated line of white points intersected by the nerves. Secondaries extending to long tails. Body greenish above.

Under side purplish brown; markings similar to the upper except the black border of the spots and arc on the primaries, and two interrupted narrow bands on the secondaries.

United States.—Expands over two inches.

BOISD.

4. **H. bathyllus** *Sm. Abb.* Figured in Sm. Abb. pl. 22. Boisd. et Lec. pl. 74.

Wings deep brown, with a narrow, interrupted transverse band of white on the primaries, and three small dots intersected by the nerves, near the summit. Secondaries without spots.

Under side paler, with dark brown narrow bands on the secondaries.

United States.—Expands two inches.

BOISD.

5. H. sylvanus *Boisd.* Ann. Soc. Ent. 2me sér. X, 313.

Upper side fulvous, with yellowish spots, of which one is situated towards the base; the others forming behind the middle a transverse and flexuous range. These spots are more apparent in the female; the male has on the primaries a black, wide, oblique streak.

Under side greenish fulvous, but more bright in the middle of the primaries and at the internal angle of the secondaries, with pale yellowish spots. Secondaries with five spots. Body above pale fulvous, below whitish. Antennæ, annulate with whitish; club, terminated with a black hook; ferruginous below.

California and Europe.

Boisd.

6. H. sylvanoides *Boisd.* Ann. Soc. Ent. 2me sér. X, 313.

Size and form of *H. sylvanus*. *Upper side* of the male like *H. sylvanus*, except that near the oblique black spot there is a blackish streak which appears to be a prolongation of it, and there are not at the extremity near the border the three or four points a little paler than the ground, which are found in *H. sylvanus*.

Under side of the female has on the disk a black triangular spot, followed by a small white transparent spot, the summit with three yellow points. Secondaries a little sinuous, with the border deep, the base widely blackish. *Under side* pale yellow, sometimes a little grayish on the secondaries, and not of a bright yellowish-green as in *H. sylvanus*.

California.

Boisd.

7. H. nemorum *Boisd.* Ann. Soc. Ent. 2me sér. X, 314.

Upper side of the male as in *H. sylvanoides*, the border a little wider, the mark of the primaries also wider, prolonged by a streak to the summit.

Under side deep yellow; that of the secondaries without spots; that of the primaries paler in the middle, with the impression of the mark of the opposite surface.

California.

Boisd.

8. H. agricola *Boisd.* Ann. Soc. Ent. 2me sér. X, 314.

Upper side blackish; that of the primaries having the mark prolonged to the summit by a blackish streak, a transverse row of yellow points between the border and this mark. That of the secondaries with the black border rather wide, and the base more or less brown.

Under side of the primaries yellow, with the mark less definite than above; that of the secondaries yellow, with a kind of transverse band, nearly median, of a paler tone.

California.

BOISD.

9. H. pratincola *Boisd.* Ann. Soc. Ent. 2me sér. X, 315.

Upper side bright yellow, nearly without border, having only in certain males some blackish triangular streaks on the nerves; that of the primaries with the mark as in *H. sylvanus*, ordinarily surmounted towards the summit with a blackish streak more or less distinct.

Under side uniform yellow; that of the primaries having towards the summit, on the edge, a small spot a little paler than the ground; that of the secondaries without spots. Female larger, with a serrate blackish border; that of the primaries having an oblique, blackish ray, surmounted towards the summit by a spot of the same color. *Under side* of the primaries nearly as in the male; that of the secondaries with a transverse, irregular row of spots paler than the ground color.

California.

BOISD.

10. H. ruricola *Boisd.* Ann. Soc. Ent. 2me sér. X, 315.

Wings a little sinuous, yellow, with a small brown border; primaries with the mark distinct as in *H. sylvanus*, marked longitudinally with a small whitish line.

Under side yellow, with all the surface of the secondaries and the summit of the primaries greenish.

California.

BOISD.

11. H. campestris *Boisd.* Ann. Soc. Ent. 2me sér. X, 316.

This species is distinguished from all the other California species, by the large truncated spot, which forms the mark of the

primaries. Figure and size of *H. nemorum*. Wings yellow, with a rather wide brown border; fringe pale yellow. Primaries of the male marked at the summit, with two or three points of the ground color. Secondaries with the disk more or less marked with black in the middle.

Under side rather pale yellow, nearly uniform; that of the primaries marked at the summit with three small paler spots; that of the secondaries with a transverse line of similar small spots.

California.

Boisd.

12. **H. sabuleti** *Boisd.* Ann. Soc. Ent. 2me sér. X, 316.

Wings of nearly the same yellow as in *H. sylvanus*, with a rather wide brown border, serrate on the primaries; the latter having the mark shorter and more truncate than in *H. sylvanus*, joined to a grayish spot; under side paler yellow, with a row of brown streaks slightly sagittate; that of the inferiors with a row of similar streaks towards the base. Female larger. *Under side* paler; that of the primaries, between the border and the disk, with a row of spots paler than the ground color.

California.

Boisd.

13. **H.? vestris** *Boisd.* Ann. Soc. Ent. 2me sér. X, 317.

Upper side russety brown; that of the primaries with four small white spots somewhat transparent, of which two are punctiform, near the upper edge; the two others larger, in the ramifications of the median nerve; that of the secondaries without spots. *Under side* duller, a little more grayish, with the same spots as above.

California.

Boisd.

14. **H. comma** *Lin.* Syst. Nat.

Resembles *H. sylvanus*, but the under side is more greenish and spotted with white. These spots are nine in number, three towards the base, the six others forming a bent row behind the middle. Fringe white, spotted with black below. Club of the antennæ terminated below by a large ferruginous point.

California and Europe.

Boisd.

[The following descriptions of new species have been kindly furnished by Mr. Samuel Scudder, of Boston. They were found among Dr. Harris' MSS., and are to appear in the new edition of his work on the insects of New England injurious to vegetation. Not having seen the species, I have placed them all provisionally under this genus.—J. G. M.]

15. H. hobomok *Harris MS.*

Dark brown above; on each of the wings a large tawny yellow spot, occupying the greater part of the middle, four or five minute spots of the same color near the tips of the fore wings, on which is also a short brownish line at the outer extremity of the central mesh; *under side* of the fore wings similar to the upper, but paler; hind wings brown beneath, with a yellow dot near the shoulder, and a very broad deep yellow band which does not attain the inner margin, and has a tooth-like projection extending towards the hinder edge. The male has not the usual distinguishing oblique dash on the fore wings, which differ from those of the female only in the greater size of the tawny portion, which extends to the front margin.

Massachusetts.

HARRIS MSS.

16. H. leonardus *Harris MS.*

Dark brown above; fore wings of the male tawny yellow on the front margin from the base to beyond the middle; behind this tawny portion is a short black line, and behind the latter a row of contiguous tawny spots extending from the middle to the inner edge towards the tip, the spots at this extremity small and separated from the others; fore wings in the female without the tawny front edge and black line; hind wings in both sexes with a central curved, tawny yellow band; wings beneath bright red-brown; the first pair blackish from the middle to the inner edge, and spotted as on the upper side; hind wings with a yellow dot in the middle, and a curved row of seven bright yellow spots behind it.

Massachusetts.—Expands inch and a half.

HARRIS MSS.

17. H. sassacus *Harris MS.*

Dark brown above; all the wings with a tawny yellow spot occupying the greater part of the middle of each, and with two or three

little detached spots of the same color near the extremity of the first pair; beneath, ochre yellow, with small pale yellow spots near the tip, corresponding to those on the upper side of the fore wings, and on the hind wings seven small square pale yellow spots, namely, one before the middle and the others in pairs behind it.

Massachusetts.—Expands one and a quarter inch.

HARRIS MSS.

18. H. metacomet *Harris MS.*

Dark brown, slightly glossed with greenish-yellow above; the male with a short oblique black line on the middle of the fore wings, on both sides of which in the female are two yellowish dots on the middle, and two more near the front margin and tip; hind wings, beneath, with a transverse row of four very faint yellowish dots, which, however, are often wanting.

Massachusetts.—Expands one three-tenths of an inch.

HARRIS MSS.

19. H. ahaton *Harris MS.*

Dark brown above; fore wings in the male tawny before the middle from the base nearly to the tip, the tawny portion ending externally in three minute wedge-shaped spots; on the middle an oblique velvet black line, near the outer extremity of which are two or three small tawny spots; *under side* spotted as above; hind wings without spot above; of a greenish or dusky yellow tinge below, with a transverse curved row of four minute yellowish dots, which are often very faint or entirely wanting. In the female there is a tawny dash along the front margin of the fore wings, and the oblique black line is wanting, but the other spots are larger and more distinct.

Massachusetts.—Expands from one to one and one-tenth inch.

HARRIS.

20. H. wamsutta *Harris MS.*

Dark brown above; fore wings with a broken row of small tawny spots towards the tip, and in the males a large tawny patch, covering the whole of the fore part of the wings from the base to the middle, and an oblique curved black line behind it; hind wings with a small tawny dot before the middle, and an indented tawny band or row of contiguous unequal spots; *under side* of the fore

wings light brown, and with larger yellow spots than on the other side; hind wings light brown, with two large irregular bright yellow spots, connected in the middle, and covering nearly the whole surface.

Massachusetts.—Expands nearly an inch.

HARRIS MSS.

GONILOBA Westwood.

Head occasionally clothed with red hairs; labial palpi as seen from above, forming two short square projections in front of the face. Antennæ with a long and slender club, the terminal half of which is reflexed, forming a slender hook, acute at the tip. Primaries long, triangular, generally marked on the disk with semi-pellucid spots. Apical margin entire, slightly convex towards the apex; discoidal cell long and narrow. Secondaries large, subtriangular; outer angle rounded, outer margin slightly scalloped, spotted with black. Anal angle produced into a short tail turned outwards or into an obtuse point. Upper disk of the wings often unspotted, but the base is yellowish or metallic-colored. Lower disk often varied with silvery patches.

1. **G. tityrus** F. Figured in Boisd. et Lec. pl. 72. Sm. Abb. I, pl. 19.

Wings brown; primaries with a transverse semi-transparent band across the middle, and a few spots towards the tip, of a honey yellow color; secondaries, with a short, round obtuse tail on the anal angle.

Under side of primaries similar to that above; that of the secondaries has a broad silvery band, edged with black. Margin of all the wings below a little paler, with the nerves black. Fringe yellow and brown.

Larva, which feeds on *Robinia*, "is pale green, transversely streaked with dark green, with a red neck, a very large head roughened with minute tubercles, slightly indented or furrowed above, and of a dull red color, with a large yellow spot on each side of the mouth."

United States.—Expands two and a half inches.

HARRIS.

2. **G. yuccae** *Boisd.* Figured in Boisd. et Lec. pl. 70.

Wings brown, lighter at the base; primaries, with a yellow spot near the centre, a broad irregular band and two oblong spots of the same color near the summit.

The *secondaries* have four square yellow spots or a macular ray. Fringe broad, yellow and brown, that of the secondaries brighter.

Under side of primaries bluish on the outer edge; the yellow band interrupted by brown, and a whitish spot near the anal angle. Upper edge with an ashy streak, one end of which is furcate.

The female is destitute of the spots on the secondaries; the band on the primaries is not so broad. Body paler than the wings.

Southern States.—Expands nearly three inches.

BOISD.

3. **G. olynthus** *Boisd.* Figured in Boisd. et Lec. pl. 75.

Wings blackish-brown, paler on the middle of the secondaries. Primaries with six or seven unequal white spots. Secondaries with three or four white spots or a macular white ray.

Under side ochry, except the lower part of the primaries; markings similar to those of the upper side. Secondaries without spots. Thorax greenish; abdomen brown above, whitish below; pectus pale green.

United States.—Expands two inches.

BOISD.

4. **G. antoninus** *Latr.* Encyc. Méthod. IX, 746.

Club of the antennæ yellowish, abruptly terminating in a sharp hook. *Upper side* of the body and wings blackish. Primaries with six or seven yellowish transparent spots from the middle to the summit, of which the one near the middle of the upper edge and two or three others are in the form of small lengthened points near the summit; the others are below, and disposed in an oblique line.

Under side the disk is deeper black, and the upper edge from the base to near the middle is yellowish-gray. On the middle of the secondaries there is a transverse range of two small spots, sometimes square, sometimes nearly punctiform, yellowish and vitreous, sometimes obsolete.

Under side of secondaries is grayish or yellowish from the base

to near the middle; then, of a reddish-brown, with the portion of the outer edge contiguous to the outer angle, paler or cinereous.

California—Brazil—Surinam.

GODT.

NISONIADES HUBN.

Head and thorax broad, abdomen elongated. Antennæ with the club somewhat fusiform, elongate, curved, with the tip gradually acuminated; that of the males larger and more slender than that of the females. Labial palpi very hirsute. Primaries divaricating and horizontally extended when at rest, with the costal margin often recurved in the males. Apical margin entire, fringe not spotted. Secondaries broadly triangular, with the outer and anal angles rounded. Fringe not scalloped, nor spotted. Hind legs with the middle spurs distinct.

1. **N. juvenalis** *Sm. Abb.* Figured in Boisd. et Lec. pl. 65. Sm. Abb. I, pl. 20.

Wings deep brown; primaries with a number of black spots, a white spot on the cellule, and an interrupted curved line of white points, three or four of which are near the costal edge. Secondaries dull brown, with two or three curved rows of paler points.

Under side of the primaries very similar to the upper; secondaries with several spots near the upper edge.

United States.—Expands an inch and a half.

BOISD.

2. **N. brizo** *Boisd.* Figured in Boisd. et Lec. pl. 66.

Wings blackish-brown; primaries with two broad transverse pale bluish lines, edged with black, serrated; on the outer edge, a row of yellowish points. Secondaries with two curved rows of similar points.

Under side of all the wings with two rows of yellowish spots near the lower edge.

The female, besides the bands on the primaries, has a zigzag yellowish transverse near the outer edge.

Southern States.—Expands an inch and a half.

BOISD.

3. **N. catullus** *Godt.* Encyc. Méthod. IX, 777. Figured in Sm. Abb. I, pl. 24.

Small; body black, head white. Wings deep black, with a transverse line of white points near the posterior edge; primaries, with other small points of this color, fewer in number on the under side, and that of the secondaries.

Var. Wings without spots on the upper side; secondaries with only one white point before the ray formed by the others; in some specimens the spots fail entirely.

Southern States.

ABBOT.

4. **N. l'herminier** *Godt.* Encyc. Méthod. IX, 777. *N. pygmæa?* Fab.

Antennæ black, with the rings and a part of the under side of the club whitish; terminal hook brown. Wings blackish, but paler below, inclining to ashy and without spots.

Carolina.—Expands nine lines.

GODART.

5. **N. tristis** *Boisd.* Ann. Soc. Ent. 2me sér. X.

Figure and size of *N. juvenalis*. Wings blackish-brown, with the fringe of the secondaries white. Primaries with some black undulations, on the middle a small whitish point, then a bent line of six similar points, separated into two groups, the one of four near the upper edge, the other of two, beyond the median nerve.

Under side paler than the opposite. In this species, as in *N. juvenalis*, the small points are placed on the most obscure little bands.

California.

BOISD.

CYCLOPAEDES HUBN.

Head as broad as the thorax; labial palpi remote, hirsute, porrected, as low as the head; terminal joint very minute, conical, nearly concealed by the hairs of the preceding joint. Antennæ short, club stout, slightly curved, not hooked at the tip, which is obtuse. Wings erect when at rest. Primaries long, fringe entire. Disk dark brown, with orange-colored spots, alike in both sexes. Secondaries short, entire; spotted on the primaries. Hind legs

with the tibiæ destitute of a pair of spurs in the middle. Abdomen, especially in the males, long and slender, with the tip slightly tufted.

1. **C. coras** *Cram.* *C. aesculapius* F. *C. otho?* Sm. Abb. Figured in Boisd. et Lec. pl. 77. Sm. Abb. pl. I, pl. 31. Cram. pap. 3, pl. 31, fem.

Small, blackish, with the body and base covered with yellowish hairs. Antennæ russety above, whitish or paler below, with the rings black. Wings traversed on both sides by a russety yellow band, formed by a suite of spots. *Upper side* of secondaries with a russety spot near the centre; *under side* with an arcuate band of spots. Male; the base of the primaries is russety yellow, which is divided in the form of striæ; the blackish line, in the form of a cicatrice, is bordered outwardly by a deep black line. On the *under side*, the spots are paler and mingle with the yellow. Along the posterior edge a row of small, round, indistinct spots.

Southern States.

GODART.

PAMPHILA FAB.

Head very broad in the males; thorax robust; abdomen as long as the secondaries. Labial palpi porrect, short, densely hairy, remote. Antennæ terminated by a thick, nearly straight club, generally with a short slender hook. Primaries alone erect in repose. Apical margin convex in males, fringe entire, not alternated in its colors. Disk in the males in many species marked with an oblique velvety patch of scales. Secondaries broadly triangular, outer and anal angles rounded, slightly truncated near the anal angle; margin entire. Discoidal vein nearly obliterated.

1. **P. zabulon** *Boisd.* Figured in Boisd. et Lec. pl. 76.

Wings brown, but this color almost displaced on the primaries by ochre yellow; a yellow mark on the brown external border. Secondaries with a large circular yellow spot on the disk. *Under side* ochry, with irregular brown spots and streaks, the latter proceeding from the base.

Southern States.—Expands a little over an inch.

GODART.

2. **P. origenes** *F.* E. S. III, p. 329. *P. cernes* Boisd. Figured in Boisd. et Lec. pl. 76.

Wings greenish-brown; primaries pale orange at the base, extending along the costal and lower edges; a spot near the middle.

Under side of primaries similar to the upper; that of the secondaries greenish-yellow. Thorax greenish; upper side of abdomen ochry.

United States.—Expands a little over an inch.

BOISD.

3. **P. arpa** *Boisd.* Figured in Boisd. et Lec. pl. 68.

Wings blackish-brown, with half of the primaries lighter; a dark band commencing on the middle of the lower edge, and extending obliquely towards the summit, and forming an acute angle with an indistinct streak proceeding from the base.

The disk of the secondaries is lighter than the borders. *Under side* of all the wings ochry yellow, with darker lines proceeding from the base, contiguous on the primaries, forming a dark brown space, which bears two ochry spots.

Southern States.—Expands nearly two inches.

GODART.

4. **P. bulenta** *Boisd.* Figured in Boisd. et Lec. pl. 67.

Wings deep brown, occupying the whole extent excepting the half of the costal rim and the outer edge, with honey yellow. Near the summit, a curved streak of brown extending into the yellow field.

The *secondaries* have two long oval yellow spots; the lower one the smaller.

Fringes yellow; sides of the thorax and of the abdomen the same color.

Under side paler; summit of the primaries pale orange; lower edge blackish, interrupted by yellow.

The *primaries* of the female are traversed by an irregular yellow band, interrupted near the summit, where it forms a large round spot. The secondaries have but one large roundish yellow spot.

Southern States.—Expands nearly two inches.

GODART.

5. **P. brettus** *Boisd.* Figured in Boisd. et Lec. pl. 75.

Wings dark brown, greenish towards the base; primaries with seven or eight yellow irregular spots, forming a curved macular band.

Under side of primaries pale brown, clearer towards the outer edge, sprinkled with pale dots.

Under side of secondaries pale green, with irregular darker spots.

Southern States.—Expands one inch.

GODART.

6. **P. arogos** *Boisd.* Figured in Boisd. et Lec. pl. 76.

Wings blackish-brown; more than half of the primaries pale yellow, with a thin short line of brown near the centre. The secondaries, with a cuneiform spot on the middle. Fringe yellowish.

Under side of all the wings greenish, and destitute of spots.

The *primaries* of the female have fine pale yellow streaks on the costal edge, below which there is a furcate streak. Secondaries without spots.

Southern States.—Expands an inch.

GODART.

7. **P. phyleus** *Boisd.* Figured in Boisd. et Lec. pl. 78.

Wings deep brown; primaries varied with yellow, forming an irregular, angular, interrupted band towards the outer margin of the primaries; a long club-shaped yellow mark proceeding from the base, with a brown streak in the centre of it, and a yellow line near the costal edge. Secondaries with five cuneiform spots, forming a curved row, the second of which is long and reaching to the base, besides a narrow yellow line extending from the base to near the anal angle.

Under side ochry yellow; primaries with sagittate brown spots near the outer edge, and a large irregular spot at the base.

The *female* is ochry yellow, with all the edges covered with cuneiform brown spots, as well as the disk of the primaries and the upper edge of the secondaries, some of which are furcate.

Southern States.—Expands over an inch.

GODART.

8. **P. leseur** *Godt.* Encyc. Méthod. IX, 748.

Wings black; ordinary spots of the primaries and those in the form of points on the secondaries of a transparent white; that of the four anterior spots of the primaries which is nearest the upper

edge, is emarginate at each end; those of the secondaries are in the form of points, of which one is isolated, nearly central, and the four others below, in a transverse row; the antepenultimate is the largest; beyond the extremity of this series, there is a fifth, very small and indistinct. Wings finely bordered with white.

United States.

GODART.

9. **P. thaumas** *Fab.* E. S. III, 327. *P. origenes* Fab. Foemina?

Small, brownish-black; anterior half of the primaries, excepting the internal edge, fulvous. The black line of the middle, common to the males, is surmounted at its interior extremity with a fulvous point, and divided abruptly at its posterior edge from the adjacent portion of the surface by a linear incision, followed by a depression; between this depression and the edge and nearly in a transverse line, are four small fulvous points, of which the inferior is a little larger and isolated, and the others in a small line. The female has in this place some white and transparent points, varying from six to eight, but the three superior are constant.

United States.

GODART.

10. **P. drurii** *Godt.* Encyc. Méthod. IX, 767.

Very similar to *P. thaumas*. Primaries blackish, with a transverse row of fulvous spots. The male has only two, of which the interior is divided into two unequal parts; the black line and distinctive of the sex form only an oblong point; it is terminated behind by the lowest of the preceding spots. Between the nerves there are two spaces, of which the scales are elevated in the form of finely striated pencils. Secondaries of a glossy russety brown; *under side* more dull, traversed by a ray of small pale yellowish spots, obsolete in some specimens.

United States.

GODART.

This species approaches very nearly the *P. vitellius* Sm. Abb. I, pl. 17. It is also probably the same as *bion* Fab. Suppl. Ent. Syst. p. 432. Another species analogous to the preceding as well as to *P. thaumas*, Fab. names *exclamationis* Ent. Syst. tom. III, pars 1, p. 326, No. 232. Wings, as well as body, blackish; primaries with a yellowish linear spot, and a point of the same color on the under side.

GODART.

11. **P. peckii** *Kirby.* Faun. Bor. IV, 300. Figured in Kirby, Faun. Amer. Bor. IV, pl. 4.

Body brown, paler on the under side. Antennæ rufous above; below the joints a white patch. Knob fusiform, hooked; wings above tawny brown, with an articulated angular band common to both wings, of pale yellow. Primaries striped and streaked with the same color near the base and in the costal area; underneath, the wings paler. Primaries have nearly the same marks as above; on the secondaries, the angular band is surmounted by another irregular spot, so as to form two contiguous spots, or rather one large irregular didymous one.

Canada.

KIRBY.

12. **P. numitor** *Fab.* E. S. III, 324. Figured in Hübn. Zutr. f. 275.

The smallest of the family. Antennæ black, rings white, terminating in a small point. Body black above, white below; upper side of all the wings blackish, but glossed for the greatest extent, with shining yellow; *under side* of primaries blackish, with the outer edge and summit yellowish; *under side* of secondaries yellowish, with the outer edge blackish.

United States.

GODART.

13. **P. vitellius** *Sm. Abb.* Figured in Sm. Abb. I, pl. 17.

Head and thorax of males clothed with greenish, fulvous hairs; club of antennæ fulvous, stem brown; primaries tawny above, with slender black veins; in the centre of the disk a large black oval spot, the anterior part of which as well as the base within are velvety, and the remainder silky. Outer margin broadly brown and uninterrupted, although irregularly notched within; two small connected, transverse, fulvous spots near the tip, separating a part of the dark border from the rest. Secondaries above darker tawny, with black veins and a broad irregularly notched dusky border all around the wings, broken near the anal angle by a longitudinal streak of orange, running to the margin. Wings beneath pale tawny; base of primaries black, with brownish tips, preceded by two small transverse patches of paler buff color, the upper one farthest from the tip. Secondaries marked along the margins with some slight dusky spots, indicating the dark border of the upper

side; a dusky spot in the middle of the disk; under side of the head and breast pale buff.

United States.—Expands an inch and a quarter.

SYRICHTHUS Boisd.

Body robust; abdomen not extending beyond the anal angle of the secondaries; terminal joint of the palpi inclined; posterior tibiæ with two pairs of spurs. Usually dark brown, with numerous translucent angular and square whitish spots, either in rows or scattered.

1. **S. oilus** *Linné*. Syst. Nat. I, 795. *S. tartarus* Hübn. *S. syrichthus* Fab. *S. orchus* Cram. Figured in Westw. Brit. Butterflies, pl. 38.

Wings rounded; primaries varied with black and white. Secondaries beneath cinereous, with waved black streaks. Antennæ black, club cinereous beneath.

Westwood.

2. **S. ruralis** *Boisd.* Ann. Soc. Ent. 2me sér. X, 311.

Wings black, with two white spots between the base and the transverse band of the primaries; secondaries with two bands of spots. *Under side* of the secondaries mingled with white and brown, the middle and the extremity having a kind of band or brownish shade, with obsolete spots between these two spaces.

California.

Boisd.

3. **S. caespitalis** *Boisd.* Ann. Soc. Ent. 2me sér. X, 312.

Wings black, with two small white spots between the base and transverse bands of the primaries; secondaries have on the middle a small macular band. *Under side* of secondaries with a narrow median band, continuous, serrate; no white spots at the base.

California.

Boisd.

4. **S. scriptura** *Boisd.* Ann. Soc. Ent. 2me sér. X, 313.

Small; the white spots small; two white spots between the base and the transverse band of the primaries. *Under side* of secondaries whitish, with the white spots distinct.

California.

Boisd.

5. S. ericetorum *Boisd.* Ann. Soc. Ent. 2me sér. X, 313.

Upper side of the male white, a little sulphury, having no other markings than a festooned terminal line, forming a row of small sagittate spots, resting on a black line at the root of the fringe; at the summit of the superiors the small spots form two or three rows. *Under side* of the wings white; that of the secondaries with two brownish bands, the one covering a part of the base, and the other at the extremity. *Upper side* of the female blackish, with two white transverse bands; the first in the middle, wide, sinuous, irregular; the second, much more narrow, formed of small sagittate spots, except that which is on the upper edge of the primaries, which is quadrangular, and cut by the nerves.

California.

BOISD.

SEC. II. HETEROCERA.

Antennæ variable; prismatic, pectinate, serrate, moniliform or filiform. Wings never erect when at rest: the posterior pair frequently frenate. Ocelli generally present. Flight sometimes diurnal, sometimes crepuscular, more frequently nocturnal.

FAM. I. EPIALIDAE.

Proboscis short or none. Palpi obsolete. Antennæ moniliform, scarcely longer than the width of the head. Thorax not crested. Abdomen not barbate. Wings deflected, long, narrow, nearly equal. Primaries opaque, secondaries semihyaline.

EPIALUS FAB.

Antennæ shorter than the thorax, moniliform, inserted at the anterior and lateral part of the head, a little above the eyes. Palpi indistinct. Proboscis spiral, but slightly apparent. Wings elongated, rather narrow, tectiform. Body more or less pilose—the last abdominal segment of the female forming an elongated oviduct

or sort of tail. Legs simple, more or less pilose. Tarsi composed of five articles, of which the last is terminated by two small hooks. The *larva* lives in the ground, and feeds on the roots of plants. It is white or reddish-white, soft and naked, or slightly downy, with a brown, horny head; a spot on the forepart of the body, brown and hard; sixteen legs. Cocoons imperfect, sometimes made of silk, sometimes of morsels of wood or grains fastened together by gummy silk.

1. **E. argenteo-maculatus** *Harris.* Figured in Agassiz' Lake Superior, pl. 7, fig. 6.

Superior wings, ashen gray, with silvery white spots near the base. Next to these are three or four brown spots, or an interrupted line of brown not extending across, terminating towards the inner angle in an oblong drab spot which extends to the edge. The centre is occupied by an oblique long spot of drab, with an indistinct touch of brown in the middle. On the upper edge there are four drab spots, the one nearest the tip being the largest and rounded below. There is a broad margin of the same color on the outer edge, gradually enlarging from near the tip and narrowing at its termination. On this margin there are three indistinct lines of silver white.

The inferiors are pale yellow, pilose at the base; an oblong drab spot on the edge near the tip, and below the tip a large spot of deeper yellow.

On the *under side* the markings are similar, but much less distinct.

HARRIS.

FAM. COSSIDAE.

Body thick, rather densely pilose. Head small. Antennæ shorter than half the length of the wings. Palpi small, eyes naked. Proboscis short, or none. Legs short and robust, more or less pilose. Wings strongly veined. Flight nocturnal. Wings in repose, tectiform.

COSSUS FAB.

Body stout. Palpi very short or not visible. Antennæ serrated or pectinated, longer than the thorax. Abdomen extending more

or less beyond the hind wings. Legs stout, pilose; hind tibiæ with four short spurs. Wings rather long, hardly broad. Primaries hardly convex along the costa, rounded at the tips, very oblique along the exterior border; first and second inferior veins almost contiguous at the base; third near the second and about twice further from the fourth. Female with a serrated oviduct.

1. **C. robiniæ** *Peck.* Mass. Agric. Soc. Report, V, 67.

Male. Dark brown. Primaries paler brown, hoary along the interior border, with irregular blackish reticulations, and with a discal blackish stripe composed of five large irregular spots. Secondaries pale luteous, black to about half the length from the base and along the costa. *Female.* Hoary, shaded with pale brown. Thorax with three slender black stripes. Primaries with irregular blackish reticulations, and some discal and anterior black streaks. Secondaries dark brown or blackish, paler towards the margin, more indistinctly reticulated. Fringe with black dots.

The *larva* bores the locust tree (*Robinia pseud-acacia*).

United States.—Male expands $1\frac{1}{2}$ inch. Female 2 to $2\frac{1}{2}$ inches.

2. **C. populi** *Walker.* C. B. M., Part VII, p. 1515.

Female. Cinereous. Antennæ black, very minutely serrated, a little longer than the thorax. Palpi black, extending as far as the head. Legs with whitish bands. Wings slightly reticulated, with very numerous minute transverse blackish streaks. Primaries with two very slender irregular blackish bands; one at beyond one third of the length; the other sub-apical and forked in front. Length of the body 14 lines. Wings expand 28 lines.

Hudson's Bay.

WALKER.

3. **C. plagiatus** *Walk.* C. B. M., Part VII, p. 1515.

Male. Hoary. Palpi not extending so far as the head; third joint very minute. Thorax with a slender black stripe along the inner side of each scapula. Tarsi gray, with whitish bands. Primaries reticulated with gray, narrower and much more oblique than those of *C. populi;* a brown patch with hoary dots on the middle of the interior border, and an irregular, sub-apical oblique band of the same hue. Secondaries gray, hoary and indistinctly reticulated with gray along the borders; fringe of the four wings

whitish, with blackish intervals. Length of the body 11 lines, of the wings 28 lines.

United States.

WALKER.

4. **C. querciperda** *Fitch.* Fifth Report, No. 294.

"Smaller than *C. Robiniæ*, with thin and slightly transparent wings, which are crossed by numerous black lines, the outer margin only of the forward pair being opaque and of a gray color; the hind wings colorless, with the inner margin broadly blackish and the hind edge coal black."

New York.

FITCH.

ZEUZERA LATR.

Body stout. Palpi very short. Antennæ slender, shorter than the thorax. Abdomen extending far beyond the secondaries. Legs stout, almost bare; hind tibiæ with two very minute apical spurs. Wings narrow. Primaries slightly acuminated, straight along the costa, extremely oblique along the exterior border; discal areolet intersected by a forked veinlet; second superior vein forked at half its length; second inferior vein more than twice further from the third than from the first; third a little further from the third than from the second. *Male.* Antennæ deeply pectinated, bare from half the length to the tips. *Female.* Antennæ bare. Oviduct exserted.

1. **Z. canadensis** *Herr. Schaef.* Lep. exot. ser. I, 168.

Male. Straw color; primaries thickly covered with little transverse brown streaks; fore part of the disk white, hind part grayish. Secondaries white, with straw-colored veins.

Canada.

HERR. SCHAEF.

2. **Z. pyrina** *Fab.* E. S. 590.

Head white, front blue, thorax white, with twelve blue points disposed in the following order: 2, 4, 4, 2. Primaries white, with black points disposed in bands; outer edge ferruginous; anterior tibiæ blue below.

North America.

FAB.

Fam. CONCHILOPODIDAE.

LIMACODES Duncan.

Body rather stout, slender in some species. Proboscis not visible. Palpi porrect, rather stout, covered with scales, extending a little beyond the head; third joint conical, acute. Antennæ of the males simple, compressed, rather serrated, pilose at the apex; those of the females slender, a little serrated towards the apex, which is acute, extending a little beyond the head. Legs stout, pilose; hind tibiæ with four spurs. Wings moderately broad, deflexed; primaries elongate, posterior margin rounded. Abdomen a little tufted at the extremity in both sexes.

1. **L. cippus** *Cram.* *L. quercetí* Herr. Schaef. Figured in Cram. Pap. Exot. I, 84, pl. 53. Sm. Abb. pl. 13. Nat. Libr., vol. 37, pl. 21, p. 177. Walker, C. B. M. V, 1144 (1855).

Brownish-red. Primaries with a curved dark brown band beyond two-thirds of the length and with some dark brown marks nearer the base; each wing with two green spots, which are divided on the outer side by a white and black border from two red spots; upper green spot transverse, smaller than the other, which is longitudinal and attenuated at its tip. Secondaries with testaceous borders and a dark brown spot on the interior angle.

Walker.

Larva destitute of feet, properly so called, their place being supplied merely by a few protuberances; and along the under side of the body there is a soft pliable membrane, covered with a kind of glutinous matter, by means of which and the protuberances, it slides rather than creeps over the surface of a body. The back appears composed of three parts, the intermediate of which is separated from the others by a kind of keel, and is oval, a little pointed at both ends; the lateral parts projecting a little beyond the edges of the body. The head is entirely retractile.

Nat. Lib.

2. **L. quercicola** *Herr. Schaeffer.* Lep. exot. I, f. 175. Walker, C. B. M. V, 1144.

Brownish-red. Primaries with a curved dark brown band, beyond two-thirds of the length, and with two dark brown discal

spots nearer the base; each wing with two small green spots, which are contiguous on the outer side to two larger red spots; fore green spot transverse, hind one triangular. Secondaries rather paler than the fore wings.

Georgia.

WALKER.

3. **L? pithecium** *Sm. Abb.* Figured in Sm. Abb. pl. 74. Nat. Libr. vol. 37, pl. 31, p. 185.

Primaries bluish, with transverse waved bands of yellowish-brown, and more or less clouded with dusky; secondaries entirely brown, with a narrow yellow line within the fringe; body of the female rather thick, thorax and abdomen bluish, the former brown on the side and the latter with brown rings. The body of the male is wholly light brown, with clouds of a deeper color, and the abdomen tufted at the apex. The female expands an inch and three lines, the male somewhat less.

NAT. LIB.

Larva flat, with long projecting appendages on each side, covered with hairs and two other projecting pieces of intermediate size behind the head, and a larger pair over the tail.

4. **L? spinuloides** *Boisd.* Figured in Herr. Schaef. Lep. exot. sp. ser. I, f. 187. Walker, C. B. M., V, 1147.

Ferruginous. Primaries with an oblong black discal spot, a row of black marginal dots, and a short white costal sub-apical streak. Secondaries pale brown, with very pale borders. *Male.* Antennæ slightly pectinated. Primaries with two oblique brown bands, which are connected by the interior border. *Female.* Antennæ simple. Primaries dingy whitish along the costa near the base, with an oblique dingy whitish band which includes the black discal spot, with a short oblique white streak resting on the interior border, and with a short sub-apical band of black dots.

North America.

WALKER.

5. **L? fasciola** *Boisd.* Figured in Herr. Schaef. Lep. exot. sp. ser. I, f. 186. Walker, C. B. M., V, 1148.

Male. Fawn color. Antennæ hardly pectinated. Primaries reddish, with a slightly oblique white band, which is forked behind and hooked in front, with a white apical spot, and with a blackish

band which proceeds from the hook of the white band. Secondaries testaceous.

North America.

WALKER.

6. **L? textula** *Boisd.* Figured in Herr. Schaef. Lep. exot. sp. ser. I, f. 184. Walker, C. B. M., V, 1148.

Female. Pale fawn color. Wings with abbreviated transverse whitish bands, whose borders are partly blackish.

North America.

WALKER.

7. **L? pallida** *Walk.* C. B. M., V, 1148.

Testaceous. Antennæ nearly simple. Abdomen extending as far as the hind wings. Primaries with two curved gray slender discal bands.

North America.

WALKER.

8. **L? flavula** *Boisd.* Figured in Herr. Schaef. Lep. exot. sp. ser. I, f. 183. Walker, C. B. M., V, 1149.

Male. Primaries pale fawn color. Antennæ simple. Secondaries whitish.

Nova Scotia.

WALKER.

9. **L. laticlavia** *Clemens.* Proc. A. N. S., Phil. 1860, p. 157.

Body and fore wings rather dark ochreous yellow. Fore wings with an oblique silvery band, inclined towards the base of the wings, from the costa to the middle of the inner margin, and toothed toward the base on the sub-median nervure or fold. A rather faint reddish-brown line extends from the costal origin of the silvery band to the hind margin beneath the middle. Hind wings pale ochreous yellow. Abdomen rather reddish ochreous.

Larva. Outline elliptical, somewhat pointed behind; body flattened, with the sides curving from a central ridge, flattened above. The ridge has a vertical elevation at its sides, growing less and less before and behind, and terminates in front in a rounded margin, and behind in an obtuse short spine. The body is smooth, with no distinct spined papulæ, but the edges of the ridge and the outline of the body are thrown into folds, sub-crenated. The body is thickest in the middle, whence it curves anteriorly and posteriorly.

General color of the body is pale green and dotted with numerous yellow points. Central ridge is bordered in front with yellow.

The *larva* feeds on the under side of the leaf of maple in September, and the *imago* appears in the spring.—*Clemens*, Pro. A. N. S., 1860, p. 157.

PIMELA Clemens. *Lagoa?* Walker.

P. lanuginosa *Clemens.* Proc. A. N. S. Phila. p. 156, 1860.

Female? The wings of my specimen are badly worn and denuded. Antennæ pale brownish-yellow. Face dark brownish; head and tail dull yellow. The anterior tibiæ and all the tarsi are dark brownish. The undenuded portion of the fore wings at the base, is woolly and pale brownish-yellow.

Male? Antennæ yellowish-white. Face and the fore legs blackish-brown, the hairs white and all the tarsi blackish-brown toward the ends. Thorax white, very slightly tinted with yellowish. Abdomen rather deep, dull yellow. Wings white, slightly tinted with yellowish; fore wings woolly toward the base, with a dark brownish discoloration along the upper part of the disk and the costa adjoining it.

Clemens.

ADONETA Clemens.

A. voluta *Clemens.* Proc. A. N. S. p. 158, 1860.

Reddish-brown, somewhat paler in the ♀ than the ♂. Fore wings with a dingy yellow streak along the base of the inner margin, extended toward the disk above the middle of the wing, and on this portion are two or three blackish dots. On the hind portion of the disk is a short black streak. In the ♂ there is another short black streak along the median nervure and its last branch, with a curved row of three black submarginal spots. The lower streak and the spots are as distinct in the ♀ as in the ♂. In both sexes there is a subapical dingy yellow patch, lightly bordered behind with whitish. Hind margin spotted with black. Hind wing pale reddish-brown.

Larva. Body semi-cylindrical, tapering posteriorly, and rounded obtusely in front. Nearly smooth, but with a subvascular row of small fleshy, minutely spined papulæ on each side of the vascular line, three of which, placed anteriorly, are separated and distinct,

and three approximated on the last rings; the intermediate ones are minute. The outline of the body above the ventral surface is furnished with a row of minute spined papulæ.

Bright green, with a broad dorsal yellow band containing a reddish purple one, which is constricted opposite the second and third pairs of anterior papulæ and dilated into an elliptical patch in the middle of the body. This is almost separated from a smaller elliptical patch which is constricted opposite the third pair of posterior papulæ and ends in a small round patch. The anterior and posterior papulæ are crimson and the intermediate ones green. The superventral row of spined papulæ are green.

In September, on the leaf of apricot. Imago in March.

CLEMENS.

EMPRETIA CLEMENS.

E. stimulea *Clemens.* Proc. A. N. S. p. 158, 1860.

Body and fore wings uniform dark ferruginous, with two small subapical white spots, and in the ♂ two more near the base of the wing beneath the median nervure. Hind wings pale reddish-brown.

Larva. Body semicylindrical, truncated obliquely before and behind, with a pair of anterior long, fleshy, subvascular, slenderly spined horns and a pair smaller beneath them, above the head; a posterior similar pair and a smaller anal pair beneath them. The superventral row of papulæ are rather large and densely spined. After the last moulting the longer horns become moderate in length.

The portion of the body between the anterior and posterior horns is a fine bright green color, bordered anteriorly and superventrally by white, with a central, dorsal, oval reddish-brown patch bordered with white, which color is again edged by a black line. The horns, papulæ, and anterior portion of the body are reddish-brown, with a small yellow spot between the anterior horns, while the posterior pair are placed in a yellow patch.

The spines with which the horns are supplied produce an exceedingly painful sensation when they come in contact with the back of the hand, or any portion of the body on which the skin is thin.

On a great variety of plants; fruit trees, the rose, Indian corn (*Zea mays*), and a number of other plants.

CLEMENS.

E. paenulata *Clemens.* Proc. A. N. S. Phila. p. 159, 1860.

Body dark reddish-brown. Fore wings dark reddish-brown along all the borders, with a large central pea-green patch, extending from the base of the wing to the subterminal portion, bordered narrowly on the inner side and behind with white, and deeply indented opposite the middle of the inner margin, where there is a bright brown patch in the reddish-brown border. Hind wings yellowish-brown.

I do not know the larval state of this species, and have only two specimens, both apparently females. I can perceive no difference in the structural characters of the imago of this and the previous species, and am quite sure that they belong to the same generic group. The discovery of the larval form will, however, determine the question.

Illinois.

CLEMENS.

NOCHELIA CLEMENS.

N. tardigrada *Clemens.* Proc. A. N. S. Phil. p. 159, 1860.

Male. Body and fore wings rather dark reddish-brown, with a small, nearly triangular pea-green patch narrowly bordered with dark brown at the base of the wing, beneath the median nervure, slightly excavated behind where it adjoins a bright brown patch. Towards the hind end of the disk, in its middle, is a minute oval dark brown streak; two small pea-green subapical spots, the one nearest the costa minute.

Larva. The body is elliptical, much flattened above. There is on each side a row of subvascular, minutely spined papulæ, of which the three anterior and two posterior are more conspicuous than the rest. The superventral row of papulæ are moderate, equal, and form the outline of the body.

General color very pale green, with dorsal patches of the general hue beautifully margined by crimson lines, and crimson vascular patches, of which those between the *fourth* and *fifth*, *seventh* and *eighth* pairs of subvascular papulæ are most conspicuous, although small. All the papulæ are pale green.

On the apricot in September. Imago in April.

The genera Pimela, Limacodes, Adoneta, Empretia, and Nochelia belong to that most anomalous family Limacodidæ. Per-

haps some of the groups described as new have been heretofore established, but I found the effort to identify them from meagre and unsatisfactory diagnoses of the imago an almost futile task.

CLEMENS.

FAM. IV. ZYGAENIDAE.

Front squamose. Palpi cylindrical, barbate, or hirsute; third article very distinct, sometimes naked. Antennæ fusiform, sometimes cylindric, and moniliform, often pectinate. Tongue long, convolute. Tibiæ armed at the apex with four more or less distinct spurs. Wings deflected, longer than the body; primaries more narrow; secondaries rounded, very rarely angular. Flight diurnal. *Larva* rather contracted, sluggish; head small, pubescent or pilose. Pupa folliculate.

ALYPIA KIRBY.

Body short, rather robust. *Head* small; eyes moderate. Proboscis shorter than half the body. *Palpi* hairy, extending a little beyond the head; second article a little longer than the first; antennæ thicker in the middle than at the apex, nearly as long as the body; thorax thick; abdomen more slender. Wings rather wide, not elongate, rounded on the margins. Feet robust, rather hairy, with strong spines.

1. **A. octomaculata** *Fab.* *A. octomaculalis* Hübn. *A. quadriguttalis* Hübn. Figured in Sm. Abb. pl. 44.

Black, with two sulphur-yellow spots on the primaries and two white ones on the secondaries; shoulder-covers and front sulphur-yellow; fore and middle tibiæ thickly covered with orange hairs. *Larva* cylindrical, elongated, yellow, with transverse rows of black points, slightly hairy, without a caudal horn. Lives on the grape-vine, and incloses itself in a cocoon in the earth.

Northern States.

2. **A. guttata** *Boisd.* Ann. Soc. Ent. X, 2me ser. 320.

Upper side black; secondaries without spots; primaries with about eighteen pale yellow, mostly rounded spots, of which two or three, towards the upper edge, are small and punctiform. Body black, with the shoulders and shield pale yellow; end of the

abdomen fulvous, as well as the head. *Under side* of the primaries like the upper.

California. Rare.

Boisd.

3. **A. McCullochi** *Kirby*. Figured in Kirby, Faun. Amer. Bor. IV, pl. 4, fig. 5.

Body and wings very black; orbits of eyes externally clothed with white hairs; tippets whitish; primaries with three white spots, one near the base, oblique, obversely wedge shaped, divided into two by a longitudinal black line; next, at a little distance from the anterior margin, is a subtrapezoidal small white spot, between which and the posterior margin is an articulated band, abbreviated at each end, of the same color, consisting of six spots divided by black lines; the same spots distinguish the under surface of these wings, and besides, there is a whitish longitudinal one on the costal area. The secondaries have three white spots on both surfaces, viz., a large rectangular one near the base divided longitudinally into four; a longitudinal band divided into five spots; the longitudinal costal streak may almost be regarded as forming a sixth. The four anterior legs are covered with orange hairs.

Canada.

Kirby.

Fam. V. GLAUCOPIDIDAE Harris.*

PROCRIS Fab. *Aglaope* Latr.

Wings narrow, elongated, opaque, immaculate. Antennæ slender, tapering at each end, and bipectinated beneath in the males. Palpi small, short, pendent, and nearly naked. Tongue short, but distinct and spirally rolled. Abdomen slender and nearly cylindrical in the males, thicker in the females, and tufted at the end. Spurs of the hind tibiæ two in number, and very minute.

Harris.

* The succeeding descriptions by Harris will be found in Silliman's American Journal of Science, vol. xxxvi.

1. **P. americana** *Boisd.* Figured in Guerin's Iconographie and Griffith's Cuvier.

Blue black, with a saffron colored collar and a fan shaped, somewhat bilobed black caudal tuft. Expands from ten lines to an inch. *Larva* hairy, green, with black bands. It is gregarious and devours the leaves of the grape vine, and undergoes its transformations in an oblong-oval, tough whitish cocoon, which is fastened to a leaf.

2. **P? smithsoniana** *Clemens.* Pr. A. N. S. p. 540, 1860.

The entire insect is greenish black; immaculate.

Texas.

CLEMENS.

3. **P. (Acoloithus** *Clemens*) **falsarius** *Clem.* Pr. A. N. S. p. 540, 1860.

Black. Prothorax fulvous, especially on the sides, with a point on the median line black. Hind wings rather thin.

Penna., Ill.

CLEMENS.

MALTHACA CLEMENS.

M. perlucidula *Clemens.* Proceedings Acad. Nat. Sci. Phila. 1860, p. 541.

Blackish-brown. Wings slightly transparent. Fore wings with the basal half luteous *above the fold.* Hind wings luteous along the costa from the base to the middle.

CLEMENS.

GLAUCOPIS FAB.

Wings narrow in some, broad in others, entire, for the most part opaque, and with the body more or less glossed with blue, sometimes spotted or partially transparent. *Antennæ* feathered or bipectinated in both sexes; the pectinations elongated in the males and short in the females. *Palpi* more or less elongated and recurved. Tongue moderate, spirally rolled. Caudal tuft minute or wanting. Posterior tibiæ with three or four spurs of moderate size.

HARRIS.

1. **G. ipomoeae** *Harris.*

Fore wings greenish-black, with three yellowish-white dots near the front margin and two others close together beyond the middle;

hind wings violet-black, with a transparent colorless spot at base; *body* tawny orange; *antennæ* and *head* black, the latter spotted with orange; a broad stripe on the shoulder-covers, a transverse spot on the thorax behind, and the incisures of the abdomen black; legs violet-black; coxæ beneath, and a spot on the thighs, orange colored.

Southern States.—Expands an inch and three-quarters.

HARRIS.

2. G. (**Cosmosoma** *Hübn.*) **omphale** *Hübn.* (according to Say). *Ægeria omphale* Say. Figured in Say Amer. Ent. VII, pl. 19.

Scarlet? wings transparent, veined and bordered with black; the first pair with a small black subcostal spot, and the black border very much widened at tip; head azure blue; antennæ black, with the tips white; two terminal joints of the palpi, and a line on each shoulder-cover black; four azure-blue dots in a transverse row on the fore part of the thorax; last four segments of the abdomen black, with four azure blue spots on each side, and a dorsal black line extending from the middle of the second segment, including in it seven azure blue spots; belly and outside of the second pair of tibiæ black.

Florida.—Expands an inch and a half or more.

For a specimen of this beautiful insect I am indebted to Mr. Doubleday. It cannot belong to the genus *Ægeria*, to which it was referred by Mr. Say, in his American Entomology, where it is figured.

United States.

HARRIS.

3. G. (**Lycomorpha** *Harris*) **pholus** *Fab.*

Blue-black or deep indigo blue; wings at base and shoulder-covers orange. Expands fourteen or fifteen lines. *Larva* pale green with yellowish spots running into the green; head black, covered with a few short whitish hairs; body sparingly clothed with rather long hairs, which are white at the sides and black on the back, the hairs arising singly from minute tubercles, those on the third segment the longest, and with the others before them directed forwards. It eats the lichens on stone heaps in shady places, and undergoes its transformation in a thin silky cocoon.

United States.

HARRIS.

4. G. **semidiaphana** *Harris.* *G. fulvicollis* Hübn.

Slate color. Wings rather narrow and subacute; first pair brownish slate, with the anterior edge clay-colored; hind wings semi-transparent in the middle; head and antennæ black; collar, front edge of the breast, and base of the palpi orange. Expands fifteen to sixteen lines.

Middle and Southern States.

HARRIS.

5. G. **latreillana** *Kirby.* Faun. Amer. Bor.

Fore wings dusky drab with a silky lustre, and the anterior edge clay color; hind wings rusty black; fringes of all the wings white, interrupted with black in the middle; top of the head, orbits behind, base of the palpi, front of the breast, and a spot on the fore part of each shoulder-cover orange; thorax, abdomen, and coxæ glaucous or greenish-blue, with a silky lustre; abdomen beneath and legs light brown.

Northern States.

HARRIS.

6. G. **latipennis** *Boisd.* Ann. Soc. Ent. X, 2me ser. 320.

Wings black, each marked on the disk with a very pale yellow spot, divided into three unequal parts; primaries near the summit, with an oblique band formed of four yellow spots of the same yellow. Body bluish-black; pectus marked with fulvous.

California.

BOISD.

7. G. **epimenis** *Drury.* Vol. III. 39. Probably genus *Brephα.*

Brownish-black. Fore wings sprinkled in spots with light blue scales, which form a narrow band near the hinder margin and marked with a large yellowish-white patch beyond the middle; hind wings with a broad dark orange red band behind the middle. The white spot of the fore wings is indented toward the middle of the wing, and on the under side there is a small triangular spot near the base of the wing and a short transverse one beyond it, which unites behind with the angular projection of the large white patch. Expands rather more than one inch.

North America.

HARRIS.

Fam. VI. ÆGERIADÆ Harris.

With *false eyes* or *ocelli*. *Secondaries* wide, entire; fringe short, vitreous, with a *frenulum;* two or three nerves on the interior margin, besides five others without a costal. Hymenopterous like insects, whose primaries usually are vitreous to the margins, and secondaries altogether. Body large; eyes naked; antennæ longer than half the primaries, gradually enlarging and again diminishing at the tip; seldom filiform; usually ciliate in the male, more seldom lamellar or pectinate. Palpi strongly developed, erect, hairy below; terminal joint sharp, naked. For the most part a distinct spiral tongue; in *Trochilium* only two short soft pieces. Legs robust, covered with scales or hairs, with two pairs of long spurs. Abdomen extending far beyond the anal angle, with seven segments (the female has but six), with red, yellow, or white rings, usually with a caudal tuft. *Primaries* narrow, at least four times longer than wide; interior angle rounded. *Secondaries* shorter but much wider; anal angle rounded. In a state of repose the wings are usually about half erected. *Larva* usually whitish, with head dark. Lives in the bark or the interior of trees and shrubs, seldom in the roots or stalks of herbaceous plants.

TROCHILIUM Scop.

Antennæ gradually thickened nearly to the end, which is curved but not hooked; tip with a pencil of hairs. Two short soft processes instead of a tongue.

Hornet like in appearance. *Body* stout; *antennæ* of the males with a lamellar process at every joint; *palpi* strong, densely pilose; *legs*, especially the posterior, clothed with a sort of fur. Male only with a caudal tuft. *Primaries* often, *secondaries* always transparent.

Harris.

1. T. marginatum *Harris.*

Black. Wings transparent; first pair with a broad border, the tip and a transverse band beyond the middle pale brown; hind wings with a broad black fringe; *antennæ* black; two longitudinal lines on the thorax; hind margins of the abdominal segments,

orbits, palpi, and legs, except at base, yellow. Expands rather more than one inch and a quarter.

New Hampshire.

HARRIS.

2. T. tibiale *Harris.*

Brownish. Wings transparent; first pair with a narrow border and an abbreviated band beyond the middle pale brown; hind wings with a narrow brownish fringe; antennæ black; orbits, two lines on the thorax, edges of the abdominal segments and tibiæ yellow; hindmost tibiæ covered with yellow hairs. Expands one inch and a half. The yellow bands on the abdomen are much narrower and less bright than in *marginatum.*

New Hampshire.—On *Populus candicans.*

HARRIS.

3. T. denudatum *Harris.*

Chestnut brown. Fore wings opaque, with a large triangular transparent spot adjacent to the outer hind angle, a rusty red spot at base, and another near the middle; hind wings transparent, with the margin and fringe brown, and a rust red costal spot; orbits, edges of the collar, incisions of the abdomen, tibiæ, and tarsi dull yellow; antennæ brownish above, rust yellow at tip and beneath. Expands from one inch and a quarter to more than one inch and a half.

HARRIS.

T. tricincta *Harris.*

Blue-black. Fore wings opaque; hind wings transparent, with the border, fringe, and a short transverse line near the middle black; palpi at tip, collar, a spot on each shoulder, and three bands on the abdomen yellow; antennæ short, black; four posterior tibiæ banded with orange; tarsi yellow, tipped with black; tail flat, with two longitudinal yellow lines. Expands from one inch to one inch and two lines.

This species seems to come near to the European *T. asiliformis;* but the male has only three yellow abdominal bands; while in the *asiliformis* there are five bands in the male sex. The antennæ are shorter and thicker than in the following species, and are furnished beneath with a double row of short pectinations or teeth, which are thickly fringed with hairs. The sexes were captured together upon the common tansy.

North America.

HARRIS.

T. cucurbitae *Harris.*

Fore wings opaque, lustrous olive brown; hind wings transparent, with the margin and fringe brown; antennæ greenish-black; palpi pale yellow, with a little black tuft near the top; thorax olive; abdomen deep orange, with a transverse basal black band, and a longitudinal row of five or six black spots; tibiæ and tarsi of the hind legs thickly fringed on the inside with black and on the outside with long orange-colored hairs; spurs covered with white hairs. Expands from thirteen to fifteen lines.

Larva similar in form and color to those of other species. Lives in the pith of squash and pumpkin vines. Forms in the ground a cocoon composed of grains of earth cemented by a gummy matter. *Pupa* almost entirely excluded from the cocoon during the last transformation.

North America.

HARRIS.

T. caudata *Harris.*

Brown. *Male* with the fore wings transparent from the base to the middle; hind wings transparent, with a brownish border, fringe, and subcostal spot; antennæ, palpi, collar, and tarsi tawny yellow; hind legs yellow; end of the tibiæ and first tarsal joint fringed with tawny yellow and black hairs; tail slender, cylindrical, nearly as long as the body, tawny yellow, with a little black tuft on each side at base. The *female* differs from the male in having the fore wings entirely opaque; the hind legs black, with a rusty spot in the middle of the tibiæ, and fringed with black; caudal tuft of the ordinary form and size. Expands from one inch to one inch and three lines. *Larva* inhabits the stems of our indigenous currant, *Ribes floridum.*

HARRIS.

T. syringae *Harris.*

Brown. Fore wings with a transparent line at base; hind wings transparent, with a brown border, fringe, and subcostal spot; antennæ, palpi, collar, first and second pairs of tarsi, and middle of the intermediate tibiæ rust red; middle of the tibiæ and the tarsi of the hind legs yellow. Expands one inch and two lines. *Larva* lives in the trunks of *Syringa vulgaris*, the common lilac.

HARRIS.

T. exitiosa *Say.* Figured in Say, Amer. Ent. VII, pl. 19.

Steel blue. *Male* with the wings transparent; the margins and fringes, and a band beyond the middle of the first pair steel blue; palpi, collar, edges of the shoulder-covers and of the abdominal segments, two bands on the tibiæ including the spurs, anterior tarsi, and lateral edges of the wedge-shaped tail pale yellow. *Female* with the fore wings opaque; the hind wings transparent, with a broad opaque front margin, and the fringe purple-black; antennæ, palpi, legs, and abdomen steel blue, the latter encircled in the middle by a broad saffron-colored band. Male expands from nine to thirteen lines; female from fifteen to seventeen lines. *Larva* inhabits the trunks and roots of the peach and cherry trees, beneath the bark. The larva is the well known peach-tree borer, which annually injures to a great extent or destroys numbers of these trees. For the means of preventing its ravages, see Say's Entomology, Vol. II, and my communication in the New England Farmer, Vol. V, p. 33. The insects above described, though very dissimilar, are really the sexes of one species. I have raised many of them from the larvæ, and have also repeatedly captured them, in connection, on the trunks of peach and cherry trees.

HARRIS.

T. fulvipes *Harris.*

Blue black. Wings transparent; margin and fringes, and a transverse band beyond the middle of the first pair blue-black; antennæ black, yellowish at the end; palpi beneath, a spot on the thorax under the origin of the wings, intermediate and hindmost tibiæ, all the tarsi, and the basal half of the under side of the abdomen orange colored; hindmost tibiæ somewhat thickened by a covering of tawny hairs. Expands thirteen lines.

HARRIS.

T. tipuliformis *Harris.*

Blue-black. Wings transparent, with the margin and fringes blackish; the first pair with a transverse blue-black band beyond the middle, and a broad one at tip streaked with copper color; antennæ black; palpi beneath, collar, upper edges of the shoulder-covers, a spot on each side of the breast, three narrow rings on the abdomen, ends of the tibiæ, and the spurs pale golden yellow; tail fan-shaped, blue-black. The male has an additional transverse yellow line between the second and third abdominal bands. Ex-

pands from seven and a half to nine lines. *Larvâ* lives in the pith of the currant bush. This destructive insect is not a native, but has been introduced from Europe with the cultivated currant bush.

HARRIS.

T. scitula *Harris.*

Purple-black. Wings transparent, with the margins golden yellow; the first pair with a narrow purple-brown band beyond the middle and a broad one at the tip ornamented with golden yellow lines; fringes blackish; front and orbits covered with silvery white hairs; antennæ black; palpi, collar, upper edges of the shoulder-covers, a narrow band at the base of the abdomen, a dorsal spot behind it, a broad band around the middle, the lateral edges of the fan-shaped tail, anterior coxæ, sides of the breast, tibiæ and tarsi, except at the joints, with the spurs golden-yellow. Expands about eight lines. This beautiful little species is easily distinguished by the prevalence of yellow on the under side of the body and legs.

HARRIS.

T. pyri *Harris.*

Purple-black. Wings transparent, with the margins, a narrow band beyond the middle of the first pair, and a broad one at tip, purple-black, the latter streaked with brassy yellow; antennæ blackish; palpi beneath, collar, edges of the shoulder-covers, a broad band across the middle of the abdomen, a narrow one before it, an indistinct transverse line at base, the posterior half of the abdomen beneath, the sides of the breast, anterior coxæ, legs except the joints of the tibiæ, and the lateral edges of the wedge-shaped tail golden yellow. Expands six lines and a half. *Larva* lives under the bark of the pear-tree. For some further particulars respecting this species, see my communication in the New England Farmer, Vol. IX, p. 2, 1830.

HARRIS.

THYRIS ILLIGER.

Wings broad, subtriangular, more or less angulated and indented, opaque, with small semi-transparent spots. *Antennæ* fusiform, but slender, and only slightly thickened in the middle; arcuated and simple in both sexes. *Tongue* moderate. *Body* short and thick; *Abdomen* conical and tufted at the end.

HARRIS.

T. maculata *Harris.*

Brownish-black, sprinkled with rust yellow dots; hind margins of the wings deeply scalloped, with the edges of the indentations white; each of the wings with a transparent white spot, which in the fore wings is nearly oval and slightly narrowed in the middle; in the hind wings larger, kidney shaped, and almost divided in two; palpi beneath, a spot before the anterior coxæ, the tips of the tarsal joints above, and the hind edges of the last three or four abdominal segments white. Expands from six to eight lines.

Massachusetts.

HARRIS.

FAM. VII. PSYCHIADAE.

THYRIDOPTERYX STEPH.

Body of the male densely pilose. Antennæ deeply pectinated, not longer than the thorax. Abdomen extending beyond the wings. Legs pilose. Wings narrow, bare, vitreous, and colorless. Primaries about twice the length of the secondaries, rounded at the tips. Secondaries slightly truncated, with a long and stout frenulum. Female apterous.

T. ephemaeraeformis *Harris.*

Black, pilose; wings vitreous; anterior margin of the primaries and interior of the secondaries squamous.

HARRIS.

PEROPHORA HARRIS.

Body stout, thickly clothed with short hairs. *Proboscis* obsolete, *palpi* short; *antennæ* of the *male* deeply pectinated to the tips; abdomen extending beyond the hind wings; legs rather short; femora and tibiæ thickly pilose; wings rather long, thickly clothed, opaque. *Female* winged; *antennæ* moderately pectinated.

P. melsheimerii *Harris.*

Pale ash red; wings irrorate with minute black points; a common oblique linear fuscous fascia bent backwards before the apex of the primaries, marked with a larger median blackish point.

HARRIS.

Fam. VIII. SPHINGIDAE.[1]

The perfect insects included in this group are characterized by the absence of simple eyes on the vertex at the base of the antennæ. The head is well developed, and well clothed with hairs, that but rarely show a tendency to become tufted; the antennæ are prismatic, and more or less thickened towards the tip, where they are recurved in the form of a hook, and surmounted by a ciliated seta; they are doubly ciliated in the males, on the sides of the plates prolonged beneath from the stalk, and nearly simple in the females: in some genera the terminal seta is obsolete, but the stalk is distinctly prismatic, and the articles are ciliated or bear short pectinations in the males. The eyes are usually large, hemispherical and salient, and the palpi have the third article reduced to a mere point, placed on the summit of the well developed second article. The tongue is usually well developed, and nearly equal to the length of the body; in some instances it is more than twice longer than the body, and in others it is almost obsolete.

The thorax is always well developed and large, containing powerful muscles, that are attached to elongated, narrow and dense wings, the inner border of which is much shorter than the exterior, in consequence of the obliquity of the hind margin, and are attached to each other by a bristle and hook. They are characterized by the following peculiarities of structure. The basal portions of the marginal and costal nervures are thick and strong, and contiguous to each other and the subcostal nervure; these and the subcosto-marginal nervules proceed towards the apex of the wing almost like a bundle of rods, thus forming an external margin capable of resisting rapid and strong vibrations upon the atmosphere. In addition to the two marginal nervules, given off from near the posterior-superior angle of the disk, the subcostal divides into a subcosto-apical, post-apical and inferior nervules. At the origin of the subcosto-inferior, the discal-nerv-

[1] The following monograph of the Sphingidæ is the production of Dr. Brackenridge Clemens, of Easton, Pa., and was published in the Journal of the Acad. Nat. Sci. Phila., July, 1859. By his kind permission it is inserted here. Everything is retained except the admirable paper on Classification which precedes it, and some minor details, besides a few Brazilian species.—J. G. M.

ure takes a transverse course, throwing off near its centre, the disco central, and joins the submedian at the origin of the medio-superior nervule; in addition to this, the median throws off more posteriorly the medio-central and posterior nervules. Lastly, near the inner margin is found the submedian nervure, which is simple and usually bifid at the base.

In the posterior wings, the costal nervure is simple and prolonged to the hind margin, and is connected with the subcostal towards the base, by a short intercostal nervule. The subcostal nervure subdivides into two branches, the apical and postapical; the discal nervure arises at the bifurcation of the subcostal, and emits the disco-central nervule about its centre, and anastomoses with the submedian at the origin of the medio-superior. The median nervure is nearly straight, but angulated at the origin of the medio-central, and posterior to this point throws off the medio-posterior. The submedian and internal nervures are both simple.

This pterogostic structure, without undergoing any essential variation whatever from the type, is found in all the genera of the group.

The abdomen is usually cylindrico-conical, longer than the posterior pair of wings, sometimes tufted at the tip, and each of its segments are furnished on the posterior edges with a row of acute spinules concealed by a covering of scales.

The legs are usually long and strong, and the under surface of the tarsi roughened with numerous, acute, rigid spinules and furnished with a pair of free, simple claws. The anterior tarsi have a long single spur on the inner surface, the middle a terminal pair, and the posterior two pair.

The eggs of the perfect insect are deposited singly on the food-plants of the larvæ, which are usually conspicuous in size when full grown, and live a solitary life. They have naked, cylindrical bodies, varying slightly in form, and presenting, usually, differences of ornamentation in the several genera. They possess eight pairs of feet, three of which are thoracic, four abdominal, and one terminal; the latter are large, strong, and almost square, with the plantæ situated at the anterior angle. On the dorsum of the eleventh segment is placed a rigid spine, called the caudal horn, and when this is absent it is replaced by a lenticular tubercle.

The pupæ are cylindrico-conical, with the extremity of the abdominal case terminating in single, stout, acute spine, and is contained in an imperfect cocoon, or near the surface in a cell, or in a subterranean cell.

Synoptical Table of Genera.

A. Anterior wings entire.

1.* Terminal margin obliquely convex.

† Antennæ clavato-prismatic or prismatic, with a short hook and seta.

‡ Abdomen long, cylindrico-conical, not tufted at the tip.

1○ *Tongue twice, or nearly twice, as long as the body.*

Macrosila.—Head large; eyes very large; wings rather broad, interior angle dilated.

S. Leucophæata.—Head large, eyes very large; wings narrow, interior angle rounded.

2○ *Tongue nearly as long as the body, or somewhat longer.*

Sphinx.—Head rather long and narrow, eyes small; wings narrow and long.

Macrosila Forestan.—Head large and broad, eyes large; fore wings broad. Wings rather short and broad, hind margin in middle slightly dilated.

Dolba.—Tongue a little longer than the body, eyes small, head broad and obtuse.

3○ *Tongue two-thirds as long as the body.*

Pachylia (*in part*).—Head large, prominent, eyes large; body thick and large.

Darapsa, Group II.—Tongue moderately long.

Interior border of wings straight.

Lapara.—Tongue moderate; head small and short; palpi very short; abdomen linear.

4○ *Tongue about one-third as long as the body.*

Ceratomia.—Body thick; head small, eyes small; thorax short, globose; abdomen long.

Daremma.—Body rather slender; tongue short, distinct; abdomen tapering.

5○ *Tongue as long as palpi.*

Ellema.—Body subfusiform; head small, narrow, subtufted and sessile; eyes small.

†† Antennæ slender, minutely serrate-setose.

‡ Abdomen more or less tufted at the tip.

Œnosanda.—Head slightly crested; tongue moderate; palpi long and slender.

Perigonia.—Head rounded, smooth; tongue rather short; palpi very short and stout.

Macroglossa.—Head very broad; tongue one-half as long as body, eyes small; palpi broad beneath.

††† Antennæ subclavate or fusiform, with a minute hook.

‡ Abdomen not tufted at the tip.

Arctonotus.—Tongue obsolete or very short; body very pilose; abdomen hardly longer than thorax.

Deilephila.—Tongue as long, or nearly as long, as body; abdomen attenuated at tip.

‡‡ Abdomen tufted at the tip.

Sesia.—Wings hyaline in the middle.

Macroglossa.—Wings opaque; tongue as long as the body.

II*. Terminal margin wavy between nervules.

Anceryx.—Tongue as long as the body; head broad and conical, eyes large; wings narrow.

M. Antaeus.—Tongue nearly twice as long as the body.

S. Juglandis ♀.—Tongue nearly obsolete.

III.* Terminal margin nearly straight or slightly sinuate.

Anceryx Caicus.—Body rather long and slender, wings narrow.

† Antennæ with a long hook tapering to the end, ciliferous in ♂, simple in ♀.

‡‡ Abdomen thick and large; wings deeply concave on inner border.

Tongue two-thirds as long as the body.

Pachylia.—Interior angle of hind wings, covered with white scales; head broad, eyes large.

Tongue as long as the body.

Philampelus.

†† Antennæ somewhat fusiform, rather short, hook minute.

‡ Abdomen oblanceolate, body long and slender.

Tongue as long as the body.

Anterior wings narrow, tip very acute, often somewhat hooked.

Chærocampa.—Head large, conical; eyes moderate; abdomen with a slender pencil of hairs.

IV.* Terminal margin excavated by the tip, convex from the middle.

‡ Abdomen without apical tuft.

Ambulyx.—Wings narrow and very long; head prominent, conical, obtuse; tongue long.

Tongue not quite as long as the body, or as long.

Pergesa.—Antennæ filiform, longer than thorax; body oblanceolate; wings slightly denticulated.

Chærocampa (*in part*).

Tongue nearly obsolete.

S. Juglandis ♂.—Antennæ subpectinated.

Tongue about one-half as long as the body.

Darapsa.—Head subtufted, front nearly vertical, eyes small; antennæ with a long hook.

‡‡ Abdomen with apical tuft.

Fore wings with silvery streaks.

Calliomma, Group II.—Head prominent, conical; antennæ minutely serrate setose.

B. Anterior wings not entire.

I.* Terminal margin angulated, denticulated, excised or indented.

1○ Fore wings with angular indentations above interior angle.

‡ Abdomen with apical tuft.

Proserpinus.—Antennæ clavate with minute hook; tongue as long as body; eyes minute.

‡‡ Abdomen without apical tuft.

Unzela.—Antennæ rather slender; tongue moderately long.

2○ Fore wings circularly excavated near the tip and interior angle, middle rounded.

Thyreus, Group II.—Head small, eyes very small; tongue equal to 3d abdominal ring.

3○ Fore wings truncated at the tips.

† Angulated and denticulated.

‡ *Tongue nearly as long as the body.*

Thyreus, Group I. Abdomen with apical tuft; head broad and obtuse; eyes small.

†† Angulated in the middle.

‡‡ Abdomen with apical tuft.

Enyo.—Antennæ subfusiform, short, with angular hook; tongue equal to 3d abdominal ring.

Perigonia.—Antennæ slender, setaceous; tongue rather short; head obtuse; palpi short.

‡‡‡ Abdomen without apical tuft, or scarcely tufted.

Calliomma, Group V.—Fore wings with silvery lines (*in note*).

Smerinthus (*in part*).—Tongue about as long as palpi.

Deïdamia.—Tongue two-thirds as long as body; body fusiform.

††† Not angulated in the middle.

Perigonia.—Group II.

4○ Fore wings denticulated.

† Without silvery streaks.

Smerinthus.—Tongue about as long as palpi or almost obsolete.

†† With silvery streaks and angulated.

Calliomma.—Group IV.

SESIA Fabr.

The body is pilose, stout and more or less oval or elliptical in outline, in the ♀, but more elongate and slender in the male. The thorax is advanced and tapers anteriorly to the head, which is small, but free and prominent, with the front broad; the eyes are very small; the palpi exceed the front and terminate acutely in a pencil of hairs; the tongue when unrolled extends to about the 5th abdominal segment; the antennæ are longer than the thorax, slender at the base, clavate and furnished with a minute seta at the extremity. The abdomen is tufted at the extremity, and about

twice as long as the thorax. The wings are transparent in the middle; the fore wings with the hind margin entire, obliquely convex, and the inner margin concave beyond the inner angle; hind wings somewhat acuminated at the tip and short. The legs are slender and the hind tibiæ with four moderate spurs. *Male*, antennæ finely ciliferous. *Female*, nearly simple.

The *larva* tapers anteriorly, has a dorsal and stigmatical stripe, and a short recurved horn. It undergoes its transformation in an imperfect cocoon on the surface of the ground.

1. **S. diffinis** *Boisd.* *S. fusiformis* Abbot & Smith. Figured in Sm. Abb. I, pl. 43. Boisd. sp. gen. pl. 15.

Head and thorax pale yellowish-green; palpi blackish terminally and pale yellow beneath; breast pale yellow, with blackish hairs beneath the legs, *and all the legs black.* The abdomen adjoining the thorax has the thoracic hue; the third and fourth segments, sometimes only the fourth, are black or blackish along the sides of the four first anterior rings, and the fifth and sixth are pale brownish mixed with yellow. The ventral surface is *bluish-black*, with pale yellow patches corresponding to the tufts on the margins of the fifth and sixth segments. The lateral anal tufts are black, the central pale brown. The disk of the anterior wings is transparent almost to the base, with a narrow, dark brownish border along the costa, a patch on the inner margin tapering to the inner angle, and a narrow terminal border in the ♂, but rather broad and dentate between the nervules in the ♀, of the same hue; a ferruginous patch on the apical interspace, sometimes followed by a smaller one in the succeeding, in the ♀. The posterior wings are bordered with dark brown on the costa near the base, broadly on the inner margin, the terminal margin in the ♂ very narrow, and moderate in the ♀.

There are variations in color; sometimes the thorax is fawn-colored above and somewhat ochreous beneath: the abdomen fawn-colored at the base, the two middle segments dark reddish-brown, the ends and sides blackish and the two terminal rings fawn-color above, with two large yellow patches on the ventral surface which is black.

Mature Larva. Pale pea-green, reddish beneath, with a dark green dorsal line, a pale yellow stigmated stripe.

Canada; Northern and Southern United States.

CLEMENS.

2. S. thysbe *Fab.* *S. pelasgus* Cramer. *S. cimbiciformis* Steph. I. *S. ruficaudis* Kirby, Walker. Figured in Cram. pl. 248.[1]

Head, palpi above and thorax dark green, mixed with brown; palpi on the sides blackish, beneath of a light cream color; the breast and legs, except the tibiæ of the hind pair, which are brownish, have the same yellowish-white hue. The eyes are slightly encircled with white scales. The two basal segments of the abdomen above are yellowish-brown; the two middle are deep ferruginous or reddish-brown, and the terminal have small ferruginous patches in the middle, the rest of each being a dull, yellowish-brown. The ventral surface is bright ferruginous, with three or four small yellowish tufts between the segments on the line separating the dorsal and ventral surfaces; the lateral anal tufts are black, the central reddish-brown and ferruginous beneath. The anterior wings, the basilar space, especially towards the inner margin, is ferruginous, and olivaceous toward the base of costa; the disk is divided by a dark brown line; the costa is dark brown and the broad terminal band has the same hue, with a ferruginous patch in the apical interspace. The posterior wings have a bright ferru-

[1] *S. ruficaudis* of Kirby.—"Body yellow olive, underneath pale yellow. Antennæ black; fore wings reddish-brown, hyaline in the disk, with the hyaline part half divided towards the base, with a costal bar; covered with yellow olive hairs at the base underneath the costa, the posterior margin and the nervures are dark ferruginous; there is also a yellow stripe on the inner side of the base; hind wings hyaline in the disk, base externally and costa yellow; internally the base is ferruginous; underneath the dark part of the wings is ferruginous and the base pale yellow; two first segments of the abdomen yellow olive, two next black, the rest ferruginous, with pale yellow lateral spots."

S. ruficaudis of Walker.—Fawn-color. Head whitish about the antennæ and beneath, with a brown band in front. Pectus testaceous. Abdomen deep red, fawn-color at the base, with testaceous spots along each side; hind borders of segments black; apical tuft red, with some black hairs on each side. Wings limpid, deep red at the base, and with broad deep red borders. Fore wings deep red at the tips and with a blackish discal streak. Length of the body 9—12 lines; of the wings 18—24 lines.

ginous, broad inner border, a moderately broad duller terminal band, the nervules in which are blackish.

Mass.; Canada; New York; New Jersey; Pennsylvania.

CLEMENS.

3. **S. fusicaudis** *Walker*, C. B. M. p. 83.

Light fawn-color. Head beneath and pectus whitish testaceous. Palpi prominent. Abdomen deep red; basal part light fawn-color, bordered with white; a row of testaceous spots along each side. Apical tuft blackish-brown; middle third part deep red. Wings limpid, deep red towards the base, and with very broad deep red borders. Fore wings fawn-color at the base, deep red towards the tips. Length of the body 13—14 lines; of the wings 25—27 lines.

Georgia.

CLEMENS.

MACROGLOSSA Ochs.

The body is rather short, stout, and thick. The head is large, broad, and prominent; the antennæ with a minute seta and about as long as the thorax; the eyes small and rather flattened; the palpi thick and very broad beneath. The thorax is thick, well advanced in front of the anterior wings, and tapering but little to the head. The abdomen is flattened beneath, tufted at the tip, and about twice as long as the thorax. The legs rather slender; hind tibiæ with four moderate spurs. The wings are opaque; the length of the anterior is somewhat less than that of the entire body, rather more than twice longer than broad across the inner angle, and sometimes thrice; hind margin entire, very obliquely convex, and the inner margin concave above the inner angle.

Larva.—The European type of this genus has a small head and a caudal horn on the 11th ring, and tapers anteriorly; the skin is finely shagreened and is marked by a stigmatal and substigmatal line. It undergoes its transformation on the surface of the ground in an imperfect cocoon. The pupa is elongated, with the head-case very salient.

§ Antennæ subclavate; tongue as long as the body.(?)

1. **M. flavofasciata** *Walker*, C. B. M. p. 87.

Testaceous blackish beneath. Head with a blackish band in front. Abdomen blackish, with a testaceous tuft on each side at the tip. Wings blackish-brown, with a broad oblique luteous band. Fore wings somewhat luteous beneath toward the base. Length of the body 8 lines, of the wings 20 lines.

Albany River; Hudson's Bay.

CLEMENS.

§§ Antennæ slender, scarcely clavato-prismatic; tongue about one-half as long as the body; not pilose.

2. **M. tantalus** *Linn.* *Sphinx ixion* Linn. *Sphinx zonata* Drury. *Sphinx titan* Cram. *M. annulosum* Swainson, pl. 132, f. 1. *M. balteata?* Kirtland. Figured in Cram. pl. 68. Drury, pl. 26. Swains. pl. 132.

Head, palpi above and thorax brown, but in the recent specimen tinged with deep olivaceous; palpi beneath whitish, and the breast and legs ash-colored or brownish-white in the male; in the female these parts have a more or less brownish hue. Abdomen brown or olivaceous brown, with the third segment banded above with white; beneath brown, the upper segments in the males having an ashy hue, with four white points on the lateral, hind portions of the ventral segments; lateral terminal tufts blackish-brown, the central testaceous. Anterior wings ferruginous-brown with a double row of whitish spots extending from the discal spot to the inner margin; discal spot blackish surrounded with white; with three white subterminal spots approximated in the subcosto-inferior, medio-superior, and central interspaces, and a terminal dull brownish band. Posterior wings blackish, costal border pale brownish-white, fringe above white and short.

South America; Mexico; West Indies; Texas; Ohio.

CLEMENS.

3. **M. ceculus** *Cramer* II, 80, pl. 146. *M. fasciatum* Swainson II, pl. 132.

Head, palpi and thorax obscure brown; palpi beneath and breast white. Thorax with a blackish patch above the base of the wings. Abdomen brown inclining to blackish posteriorly, with two orange-colored spots on each side of the second and third segments, a blackish-brown patch on the fourth and a pale yellow spot on the fifth, with a lateral tuft beneath it of the same hue. Terminal tufts dark brown. Abdomen beneath brown. Anterior wings obscure purplish-brown, varied with dark brown; a dark brown

patch at the base, with a line and band of the same hue crossing the disk; a dark brown demi-line extending from the origin of the medio-central nervule to the inner margin, and a line crossing the base of the nervules furcate above, with a subterminal band also furcate toward costa, of the same hue; a white spot in medio-central interspace. Posterior wings blackish-brown, with a central pale orange-yellow band.

South America; Mexico.

CLEMENS.

4. **M. sagra** *Poey*. Cent. de Lep. de l'Ile de Cuba, Decade II, with figure. Walker, C. B. M. p. 89.

Cinereous brown, testaceous beneath. Thorax with two ferruginous stripes on the sides, margined between with hoary. Abdomen ferruginous, tessellated with hoary, with two pale yellow spots on sides of middle segments, and two rows of white spots beneath. Wings rather broad, with a white line near the base and varied with ferruginous bands, especially a broad interrupted one near external border; a white spot toward the end of medio-central interspace. Posterior wings blackish, with an oblique, central, pale yellow band, and the exterior border margined with the same hue.

South America; West Indies.

CLEMENS.

PROSERPINUS HÜBNER.

The body is rather long, slender and tapering. The head is free, prominent and moderately large; the front broad, oval and obtuse; the antennæ subclavate, longer than the thorax, with a minute terminal setigerous hook; the eyes minute and shaded with hairs from above; the palpi are pilose, rather thick and equal to the front; the tongue as long as the body. The thorax is advanced and tapers in front to the head, and is smooth. The abdomen is twice longer than the thorax, cylindrico-conical, with an abundant terminal tuft in both sexes; very sparingly tufted on the sides. The legs are slender and smooth, the posterior tibia with four moderate spurs. The anterior wings are as long as the body without the the tuft; three times longer than wide across the inner

angle; tip acuminated, the hind margin entire and obliquely convex from the tip to the medio-posterior interspace, where it is angularly indented; the inner angle salient and the inner margin concave above it. Hind wings rather short, obtusely rounded at the tip and the hind margin entire. *Male.*—Antennæ finely ciliferous. *Female.*—Antennæ simple.

Larva tapers anteriorly from the third segment, body cylindrical, head small and the eleventh segment with a caudal horn. It is ornamented with rows of vascular round spots, and irregularly elliptical subdorsal and lateral spots. The metamorphosis takes place on the surface of the ground in an imperfect cocoon.

Duponchel describes the larva of this genus, under the name *Pterogon*, as having a lenticular tubercle instead of a caudal horn. The outline of the wings, as given in the diagnosis, differs also from the European type, in which the fore wings are slightly hooked, with two or three distinct dentations. Abbot and Smith represent the wings of *P. gauræ* with these peculiarities, but my specimens do not correspond.

CLEMENS.

1. P. gauræ *Abbot & Smith.* Figured in Sm. Abb. 1 pl. 31.

Antennæ brownish-green and whitish at the tips. Palpi beneath, white; the tips of the palpi, head and thorax greenish, with a greenish white line on the sides of the head and thorax. Abdomen greenish or brownish-green, and the apical tuft the same, with the hind portions of the segments paler. Anterior wings pale yellowish-green, with deep green shades; the basal portion pale yellowish-green, with a broad, median dark green band, the anterior edge of which is concave, and its posterior, beginning on the costa at the origin of the post-apical vein, inclines to about the middle of the inner margin. The median band is bordered posteriorly with pale yellowish-green, and the terminal border is shaded with bright greenish, deepened toward the costa and tip, with a pale streak at the tip and a pale line from the costa to subcosto-inferior vein. The discal spot is dark green on a somewhat lighter ground. Posterior wings orange, with a narrow terminal blackish

band; sometimes the orange color is deepened to reddish above the terminal band; fringes paler.

Texas.

Mature larva, head green. Body dark green; with the first segment banded with white containing four black points; with a row of vascular black dots, and two rows of semi-elliptical black dorsal patches edged with white, and a row of lateral somewhat oval patches, blackish and crimson behind, also edged with white; a row of subdorsal dots between this and dorsal patches; prolegs crimson, with crimson patches on the sides of the tenth and eleventh segments. Horn yellow at the base and black terminally. (*Abbot & Smith.*)

Pupation.—The larva enters the pupa state in Georgia about the latter part of May, and appears as a perfect insect during the middle of June. (*Abbot & Smith.*) In Texas there are two broods of perfect insects, according to the dates of capture, one during the entire month of April and another in July.

Food-plants.—*Gaura biennis.*

Georgia; Texas.

CLEMENS.

2. **P. clarkiæ** *Boisd.* Ann. Soc. Ent. Fr. X, 2me ser. p. 318.

The appearance (port) and size of *P. gauræ* of Georgia. Superior wings of an olive-green, with the extremity faintly tinted with a little greenish-white and a transverse whitish, nearly straight band. Inferior wings of the same yellow color as the European Œnotheræ with a little black border. The four wings of an olivaceous green beneath, with a whitish band on the inferior wings. Body olivaceous.

California.

CLEMENS.

UNZELA WALKER.

Body fusiform, rather stout. Proboscis moderately long. Palpi as usual. Antennæ rather slender. Abdomen much less than twice the length of the thorax. Legs moderately stout; hind tibiæ with four rather short spurs. Wings moderately broad, not long. Fore wings straight along the costa, rounded at the tips; exterior border slightly oblique, forming a very obtuse and much

rounded angle in the middle, with a slight excavation in front and two shorter and more distinct indentations behind. Hind wings rounded at the tips; exterior border slightly denticulated, somewhat excavated toward the interior angle.

1. **U.? japyx** *Cramer*, I, 137, pl. 87, f. C. Walker, C. B. M. 162.

Ferruginous brown. Abdomen purplish with testaceous bands on the hind portions of the segments and a white transverse band at the base of the abdomen. Thorax dark brown. Anterior wings dark brown from the base to the middle, with two somewhat roseate, separated, oblique lines crossing the middle of the disk and a round spot at the base margined with roseate; terminal portion of the wing greenish with a black spot on costa at about the origin of the post-apical nervule, another beneath the tip on posterior margin and a larger one at the inner angle, containing a small blue spot. Posterior wings dark brown, somewhat roseate on inner margin, with a black terminal line.

THYREUS Swainson.

The body is obtuse, broad and stout. The head is moderate, the front obtuse, nearly vertical, uniformly broad and thickly haired; the palpi very hairy, rather short and obtuse; the eyes small: the tongue, when unrolled, reaches to about the fourth or fifth abdominal segment; the antennæ taper at the extremity and end in a long hook without seta. The abdomen is broad and rather short, a little more than once and a half longer than the thorax, semi-oval in outline, tufted with terminal and lateral tufts. The thorax is thick, hairy, globosely rounded in front with metathoracic sub-tufts. The wings are narrow and rather long. The anterior in length equal to that of the body, truncate at the tips, angulated opposite the medio-superior nervule, excavated from post-apical to superior and doubly excavated from the superior nervule to the inner angle. Posterior wings, tip rounded, hind border denticulated and the inner angle somewhat salient and acute. *Male.*—Antennæ ciliferous. *Female.*—Almost cylindrical and simple.

Larva, the head is moderate and the body is naked, wrinkled transversely, and tapers gently from the fourth segment, and is furnished with a lenticular tubercle on the eleventh segment instead of a caudal horn. Its position when disturbed is not sphinx-like; it shortens the anterior rings and throws the head from side to side, making at the same time a crepitating noise. When on the ground, its motions under irritation are often violent. It prepares for pupation on or near the surface of the ground.

1. **T. abbotii** *Swainson*. Figured in Swains. pl. 60.

Head, palpi, and thorax, dull chocolate-brown; prothorax with a blackish-brown transverse line, and two others crossing the middle of thorax; abdomen dark-brown, lighter in the middle; terminal tufts dull yellowish-brown in the male, and female with a large light-yellowish central pencil, and small lateral brownish ones. Anterior wings dull-chocolate brown, lighter beyond the middle, even yellowish-brown in the female; an oblique dark-brown line passing behind and near to the minute dark-brown discal dot; several dark-brown lines on the inner margin, and curving obliquely to the lower part of medio-superior nervule, and proceeding thence to the costa as sharply-angulated lines, and long dark-brown dashes projecting upward in the interspaces; apical interspace grayish-brown, with a dark-brown sagittal dash on the margin, and others in the three following marginal interspaces: fringes dark-brown. Posterior wings sulphureous, with a dark-brown terminal band, breaking into a series of short lines in a slightly roseate space above anal angle; fringes brown.

Mature Larva. *Male*, head dark-brown, banded broadly at sides with light-green, and with a narrow central, short greenish band. Body reddish-brown, with numerous patches of light-green, oval on the dorsum, and irregularly triangular on the sides, with an interrupted, subdorsal chocolate-colored line. The lenticular tubercle on the eleventh segment is black, encircled at the base by a yellowish line and a blackish cordate patch; anal shield pale green terminally, and brown above, crossed by irregular brown lines. *Female*, body uniform reddish-brown, or blackish-brown, immaculate; with interrupted dark-brown subdorsal lines, and numerous transverse striæ. Length about three inches. Swainson's figure of this larva is erroneous.

Pupation. The transformation of the larva takes place in a superficial cell. The pupa is dark-brown; the head case broad and rounded; the tongue case not apparent, and level with the breast. There is, I think, but one annual brood. The larva reaches its development about the latter part of July, and enters the pupa state to appear in the following spring as an imago.

Food-plants. The indigenous and cultivated grape-vines, and *Ampelopsis quinquefolia.*

New York; Pennsylvania; Georgia; Massachusetts; Ohio.

CLEMENS.

GROUP II.

The thorax tapers on the sides markedly to the head, which is small and prominent. The front is smooth and narrow, the eyes very small, the palpi acutely haired at the extremity, and exceeding the front, the antennæ with a moderate hook without seta; the tongue extends to about the third abdominal ring. The tip of the anterior wings is rounded, the hind margin circularly excavated beneath tip, and above the inner angle, the middle being convex. Posterior wings, hind margin scarcely denticulated, and slightly excavated near the inner angle.

2. T. nessus. Figured in Cram. pl. 107. Walker, C. B. M. p. 99.

The head, palpi, and thorax, dull ferruginous brown, palpi beneath and breast rufescent; a yellowish-white streak on the sides of the head and thorax, and a transverse ferruginous line on the hind part of metathorax. The abdomen a dark chestnut-brown, with the hind margins of fourth, or fourth and fifth segments, pale yellow, with three or four bright ferruginous, lateral spots, beginning on the fourth segment, and two very small pure white tufts on the segments adjacent to the triple apical tuft, which is deep chestnut; beneath rufescent, with three lateral white dots on the hind portions of the posterior segments. Anterior wings brown, with a purplish hue, costa grayish-brown; an indistinct dark-brown band and line in basilar space; a dark chestnut, broad median band, divided above the medio-superior nervule to the costa, and containing a lighter colored discal spot; a grayish-brown subterminal line interrupted by the central nervules, and edged anteriorly

with brownish, with a long, dark-chestnut patch interposed in the medio-central interspace; a ferruginous patch at the base of apical interspace, with two dark-brown adjacent patches in the succeeding interspaces. The fringes dark-brown in the middle, pale yellow in the excavations, and bordered by dark-brown. Posterior wings bright-red, with a dark-brown terminal band; fringes from the tip to the centre brownish, and thence to anal angle pale yellow.

Canada; Massachusetts; New York; Pennsylvania; New Hampshire.

CLEMENS.

DEIDAMIA CLEMENS.

Size moderate. The body is quite fusiform, and the inclination of the sides of the thorax to the head is quite abrupt. The head is small, almost impacted on thorax, but not depressed; it is compressed laterally and subtufted, the front vertical and moderately broad; the eyes small, and somewhat sunken; the labial palpi short and pilose; the tongue extends to the end of the third abdominal segment; the antennæ taper at the end, slightly hooked, and without the terminal seta. The thorax is thick, and well clothed with long decumbent hair. The abdomen is long, rather slender and oblanceolate, with an exceedingly slight terminal tuft. The legs are rather slender, and moderately long, the anterior tibiæ tufted at the sides; the posterior with two very short middle and terminal spurs concealed in the tibial hairs. The anterior wings are about equal in length to that of the body, and are a little more than twice longer than broad across the inner angle; the hind margin angulated in the middle, truncate at the tip, excavated from the postapical nervule to the medio-superior, and angularly indented above the inner angle; the inner margin concave. The posterior wings are rounded at the tips, hind margin slightly denticulated. The submedian nerve is simple at the base. *Male*, antennæ ciliferous. *Female*, antennæ simple.

1. **D. inscripta.** *Pterogon? inscriptum* Harris. *Thyreus? inscriptus* Walker, C. B. M. p. 308.

The head is grayish-brown, and whitish above the eyes; palpi reddish-brown. Thorax grayish-brown, with a double, curved white line crossing the prothorax, edged behind with brown, and a brown sagittal dorsal patch, with a short whitish line across the middle of tegulæ. The abdomen is dull brown above, with three or four subdorsal, deep brown spots; beneath, a dull ferruginous brown, with the hind portions of the segments of a lead color. Anterior wings ash-gray at the base, in the middle, and towards the tip, banded with brown; a short, obscure, brown costal streak at the base; two brownish bands before the middle, united on the inner margin by blackish-brown; discal spot ash-gray; a reddish-brown band, arising on the costa at the origin of post-apical nervule, convex in the middle, and retreating thence to the inner margin; the subcosto-inferior and medio-superior interspaces pale-brown, as well as the portions of the succeeding interspaces exterior to the band, and marked by reddish-brown lunules; a deep brown apical patch encircled with white; and a subterminal one similarly colored in post-apical interspace. Posterior wings dull reddish-brown, with a dusky terminal border tapering to the inner angle; fringes white.*

Indiana; Long Island; New York; Pennsylvania.

CLEMENS.

PERIGONIA Boisd.

Body broad, slightly fusiform. Head obtuse. Proboscis rather short. Palpi very short and stout. Antennæ setaceous, slender, a little longer than the thorax. Abdomen much longer than the thorax. Legs rather slender; hind tibiæ with four moderately long spurs. Wings opaque, moderately broad. Fore wings hardly convex toward the tip of the costa, rather oblique along the exterior border, which is slightly angular in the middle and behind the tip; fourth inferior vein (posterior) remote from the others. Hind wings very slightly denticulate along the exterior border. *Male*, antennæ minutely serrate setose. *Female*, antennæ simple. (*Walker.*)

* *Pupation.*—Larva transformed in a cell. Tongue-case of pupa, an elevated short ridge; at its cephalic end a short central spine, and on each of the eye-cases, a spinous tubercle. Color, very dark brown.

1. **P. lusca** *Fabr.* *Perigonia stulta* Boisd.

Ferruginous brown, somewhat cinereous and testaceous beneath. Fore wings with three grayish, diffuse bands, and transverse blackish lines. Posterior wings with variable luteous bands, and streaks along the interior angle.

Mexico; South America; West Indies.

CLEMENS.

GROUP II.

Fore wings not angular in the middle of the exterior border, and are excavated behind the sub-apical angle. The exterior border of hind wings convex, and not denticulated. Head conical.

2. **P. subhamata** *Walker*, p. 102.

Brown (male) or ferruginous (female), paler beneath. Wings with oblique, undulating, pale ferruginous bands, which are most numerous on the fore wings, and the latter have a discal dot of the same hue, and a cinereous sub-apical spot. Length of the body 13—15 lines; of the wings 28—32.

Mexico and South America.

CLEMENS.

GROUP III.

Head rounded in front, not conical. Fore wings somewhat rounded at the tips, slightly convex and not excavated along the exterior border, which is very oblique.

3. **P. glaucescens** *Walker*, p. 103.

Brown, testaceous beneath. Head with a white streak on each side behind the eye. Antennæ tawny, very slender, not longer than thorax. Thorax slightly tinged with green. Abdomen ferruginous, slightly glaucous; fifth segment whitish; sixth and seventh segment with a whitish tuft on each side; apical tuft blackish. Wings reddish beneath. Fore wings with a glaucous tinge, and with two oblique bands, the one dark brown and interior, the other ferruginous and exterior, and bordered with dark brown on its outer side. Hind wings dark brown, with a luteous spot by the interior angle, and a white speck near the base of the interior border. Length of the body 12 lines; of the wings 28 lines.

CLEMENS.

4. **P. undata** *Walker*, p. 103.

Brown. Head beneath and pectus somewhat hoary. Thorax with a short, broad, posterior, dark brown stripe on each side. (Abdomen and hind wings wanting.) Fore wings cinereous, shining, with a white dot and a black discal streak at the base, with a white streak traversing the black discal spot, and with two broad, irregular, ferruginous bands, which are bordered, and the exterior one interlined with black. Length of the body 9(?) lines, of the wings 18 lines.

Jamaica.

CLEMENS.

ENYO Hübn.

The body is long, thick and fusiform. The head large, prominent and broad; front nearly vertical, flattened, and smooth; eyes large and salient; palpi smooth, stout and closely applied to the front; tongue extends to the end of the third abdominal segment; antennæ rather short, not as long as the thorax, minutely ciliferous, fusiform and ending in an angular hook with seta. The thorax is crested in front, long from the base of anterior wings to the head, and rounded in front. The abdomen is oblanceolate, slightly more than twice longer than the thorax, and sparingly tufted at the apex. The legs are slender, the anterior and middle smooth, the posterior with femora and tibiæ pilose, with two short and two moderately long spurs. The anterior wings are very oblique, length much less than that of the body, and somewhat more than twice longer than broad across the inner angle; the posterior margin truncate at the tip, obtusely angulated opposite medio-superior nervule, excavated from post-apical to superior, and thence excavated and slightly wavy to the inner angle, which is hooked; inner margin deeply concave. Posterior wings rounded at tip; hind margin doubly excavated from the medio-central to inner angle, which is acute.

Larva. Head rather small; body tapers anteriorly, and is wrinkled transversely, with a long, straight, caudal horn. *Pupa*

rather slender; head case obtuse; tongue case not apparent. The larval transformation is subterranean.

1. **E. lugubris** *Drury*, I, 61, pl. 28, f. 2. Abbot & Smith, I, pl. 59, pl. 30. *Thyreus lugubris* Harris. *Sphinx fegens* Cramer.

Head, palpi, thorax and abdomen brown, with an obscure purplish or reddish hue; palpi beneath pale reddish brown. Abdomen with an indistinct double row of dorsal, dark brownish spots; beneath as well as the thorax, pale rufescent brown, with a tawny line in the middle of ventral surface; yellow lateral dots on the hind portions of the segments, and a small lateral, pale yellow pencil of hairs at the base of the first segment. Anterior wings brown, with a rufous tinge in the middle and toward the tip; an oblique, pale brown line before discal spot, beginning near the origin of subcosto-inferior vein, margined on each side with darker brown; discal spot blackish, edged with pale brown; a broad, dark brown, subterminal shade, extending from post-apical vein to the hind margin, and bordered anteriorly by a curved, pale brown line; a ferruginous brown spot in apical interspace, with its basal portion and the middle of the next interspace pale reddish hue and three indistinct brownish lines crossing the nervules. Posterior wings brownish, deepening toward terminal margin, with indistinct lines above the inner angle, and dark brown marginal spots at the inner angle and on the ends of medio-posterior and central veins.

Mature Larva. Head dark green, with a yellow frontal band. Body pale green, with vascular dark green dashes, and a dark green subdorsal line bordered beneath with whitish; nine short, lateral, pale yellow bands; horn dark green; stigmata reddish. (*Abbot & Smith.*)

Food-plants. *Ampelopsis hederacea.* (Virginian creeper.)

Georgia, West Indies, Mexico, South America.

CLEMENS.

2. **E. camertus** *Cramer.*

Mouse color; abdomen with a double row of blackish brown spots. Fore wings with a testaceous discal spot; with a blackish oblique interior line margined with hoary, and a large diffuse exterior blackish patch, with a sub-apical ferruginous spot and a blackish submarginal line edged with white. Posterior wings with dark oblique undulating lines and blackish marginal spots.

Mr. Walker's description does not correspond well to Cramer's

figure, pl. 525, which is dark brown, and the anterior wings luteous brown, with a broad dark brown median band tinged obscure purple. The following individual from Brazil, in the collection of the Academy of Natural Sciences, of Philadelphia, appears to me to come nearer to Cramer's figure.

Dark brown; thorax distinctly crested. Abdomen dark brown with a double row of spots on the sides, and a small lateral rufous terminal tuft and a long central one dark brown, with a cinereous ring just above them; beneath, a dull cinereous central line edged with dark brown. Anterior wings dark brown varied with obscure purplish; basal portion dark brown, with a dark median patch chiefly beneath the median nerve and intersected by paler lines on the inner margin, and bordered behind and above broadly with a paler hue; a dark brown patch extending from the origin of subcosto-inferior vein to the tip of post-apical, excavated on each side beneath, and extended as a line to the margin at the end of medio-posterior vein, inclosing a lighter patch in the middle on the costa, and at the tip mixed with rufous; a testaceous curved marginal patch. Posterior wings dark brown, paler towards the hind margin. *Posterior legs hairy to the end of the tarsi.*

Mexico, West Indies, South America.

CLEMENS.

DEILEPHILA Ochs.

The body is usually stout and thick. The head moderate, prominent; the front smooth, rather broad and long, semi-elliptical; the eyes moderate; the tips of the palpi level with the front; the tongue as long or nearly as long as the body; the antennæ clavate, terminating suddenly in a minute hook and seta. The thorax is thick, and tapers abruptly to the head. The abdomen is thick and cylindrico-conical, about twice as long as the thorax, and tapers rather suddenly at the terminal segments, having at the tip a more or less distinct, short pencil of hairs. The wings are entire; the length of the anterior equal to that of the body, rather more than twice and a half longer than broad, the hind margin obliquely convex; the inner somewhat concave above the interior angle. The posterior wings are rounded at the tip and the hind border slightly excised near the interior angle.

The legs are long and the two exterior spurs of the hind tibiæ very short, the two interior long. *Male.* Antennæ ciliferous. *Female.* Antennæ simple.

Larva. Head small and elongate-globose, caudal horn rather short, nearly straight and rough. Without oblique bands, but with a row of subdorsal spots on each side. The anterior segments are much attenuated, and are capable of being withdrawn or shortened or much extended; none of the segments dilated. When disturbed, they fall from their food-plants, shorten the anterior segments and bend the head toward the terminal extremity. In repose, the anterior rings are merely shortened. The larval transformation takes place in a superficial cell excavated from the surface.

1. **D. lineata** *Fabr.* *Sphinx daucus* Cramer. Figured in Cram. pl. 125. Sm. Abb. pl. 39.

Palpi white beneath. Head and thorax dark olive with a white line on each side extending to the end of tegulæ, where it is edged above slightly with blackish; two white dorsal lines and one on superior edge of the tegulæ. Abdomen greenish-brown, tinged with reddish on the sides: a white dorsal line with a double row of black dorsal spots and lateral alternate white and black spots. Anterior wings deep olivaceous, with a straight buff-colored band from the inner margin of the base to the tip, and its basal and apical portion whitish; the olivaceous portions of the wing are bordered and shaded with black; a white discal line and all the nervules white except the apical; a marginal bluish-gray space and fringes dark buff. Posterior wings black, costa brownish, with a rose-colored central band, including a white spot near the inner margin and a marginal reddish line; fingers white.

Mature Larva. Head dark green, dotted with yellow dots. Body uniform yellowish-green; a dorsal patch on first segment darker and dotted with yellowish-white; a subdorsal row of elliptical spots, connected by an intermediate faint yellow line; the spots consist of two curved short black lines, inclosing superiorly an orange-yellow dash, and inferiorly the yellow subdorsal line. The stigmatæ are reddish-orange, black margined on a yellow base.

Shield and terminal prolegs roughened with white dots; caudal horn yellowish-orange toward extremity, and rough. Feet yellow. Length about three inches.

Pupation. The pupa is light brown, the head-case compressed laterally and prominent; tongue-case not apparent. In Pennsylvania the first brood of larvæ reach maturity about the latter part of July, and appear as imago about the middle of August. There is doubtless a second brood, but I have never seen them during autumn. In Texas, the first brood of perfect insects occurs from about March 10th to April, and there is another about the middle of July.

Food-plants. *Portulacca oleracea* (purslane) and the turnip. I have, however, fed the larva in confinement on the leaves of the *apple-tree.*

Mexico; West Indies; Canada; entire United States; the western plains to the Rocky Mountains, and California.

CLEMENS.

2. **D. chamænerii** *Harris.* *D. intermedia* Kirby, Faun. Bor. Am. p. 302. Figured in Agass. Lake Sup. pl. 7.

Palpi beneath whitish. Head and thorax olive-brown, with a white line on the sides, margined on the tegulæ above with blackish. Abdomen brownish-olive, with small dorsal white spots, with two lateral alternate white and black patches on the sides at the base, fourth segment immaculate and fifth and sixth white spotted. Beneath, the thorax is testaceous and the abdomen dark brownish with white lines on the hind portions of the segments. Anterior wings deep olivaceous, with a buff-colored band from the inner margin of the base to the tip, sinuous posteriorly and irregularly indented before; a black patch at the base and one at the origin of disco-central nervule, with an indistinct whitish discal spot. The terminal margin dull brown and black, margined before; fringes brown. Posterior wings black, with a rose-colored central band, deepening toward the inner margin and including a white spot; the hind margin is indistinctly marked with reddish, and the fringes white.

Mature Larva. Green, somewhat bronzed, dull red beneath; with nine round cream-colored spots encircled with black on each side, and a dull red caudal horn. *Harris.*

Food-plants. *Epilobium angustifolium* (great willow-herb).

Canada—United States.

CLEMENS.

[Dr. Clemens regards this species, on the authority of Walker, as identical with *D. galii* of Europe.—J. G. M.]

PERGESA WALKER.

Body moderately stout. Proboscis long. Palpi as usual. Antennæ slender, rather longer than the thorax. Abdomen oblanceolate, more than twice the length of the thorax. Legs long, slender; hind tibiæ with four long spurs. Wings rather long, moderately broad, very slightly denticulated along the exterior border. Fore wings hardly convex in front, acuminated; exterior border rather oblique, very slightly undulating, its fore part very slightly concave. Hind wings rounded at the tips.

In the European *Porcellus* the head is free, short, obtuse, and broad. The body short and stout. The palpi project beyond the clypeus; the eyes are quite small but salient; the tongue scarcely as long as the body; the antennæ rather clavato-prismatic, with a short hook and seta. The thorax is short and obtuse in front. The length of the anterior wings about equal to that of the body, and are a little more than twice longer than broad across the inner angle. The hind margin of the posterior wings is slightly wavy. The individuals were formerly part of the genus Chœrocampa.

Larva. Smooth, anterior segments retractile, with ocellated spots on the sides of the fifth and sixth, and *without a caudal horn.*

1. **P. thorates** *Hübner*, Exot. Schmett. f. 525.

Green, testaceous beneath. Head and thorax with a white line on each side. Thorax and abdomen somewhat golden-hued on the sides. Abdomen rufo-fawn color, with green along the dorsum toward the base, and a row of yellow dorsal dots. Anterior wings with interrupted whitish bands curving from inner margin to costa, and tinged with rufescent; with brown lines at base of the nervules, and a greenish patch over the middle of median nervules, with a pale brown apical patch above it; marginal space rufo-brownish.

Posterior wings blackish at base, with a broad, median, luteous band, and a brown marginal band.

Var. β. *Male.* Fawn-color; anterior wings gray and brown mixed, with a silvery discal spot. Posterior luteous, interrupted with ferruginous along exterior margin.

Var. γ. *Female.* Anterior wings rufescent, banded with gray and brown mixed.

Mexico; West Indies.

CLEMENS.

DARAPSA WALKER.

Size moderate, body rather slender and tapering. The head is small, narrow, and almost sessile; the vertex subtufted, front vertical; the eyes small; the palpi short and rather slender; the tongue about *one-half* as long as the body; the antennæ a little longer than the thorax, slender and almost filiform, with a long hook without seta. The thorax is rather short, almost globosely rounded in front. The abdomen oblanceolate, thrice as long as the thorax. The anterior wings are as long, or somewhat longer than the body, twice and a half longer than broad across the interior angle; the tips acuminated, the hind margin excavated rather deeply from beneath the tip to medio-superior vein, and thence convex to the interior angle; the inner margin deeply concave above interior angle. Posterior wings with tips rather pointed and hind margin somewhat excavated before the interior angle. *Male.* Antennæ prismatic and ciliferous. *Female.* Antennæ slender and almost filiform.

Larva. Head very small and elongate-globose. The body tapers suddenly to the head, from the anterior portion of the third segment, which, together with the fourth and fifth, are much swollen. The anterior rings are retractile within the fourth. A caudal horn on the eleventh segment. It is ornamented with a subdorsal line and irregularly oval lateral patches. The larval transformation takes place on the surface of the ground in an imperfect cocoon, consisting of vegetable debris united by silken threads.

During the day the larva conceals itself beneath a leaf, stretching out the body on the midrib.

1. **D. chœrilus** *Cramer*, II, 91, pl. 247. *Sphinx azalea* Abbot & Smith. *Chærocampa chærilus* Harris. Figured in Sm. Abb. I, pl. 27.

Head, palpi and thorax ferruginous brown, with a spot at the base of anterior wings, and tegulæ behind tipped with brownish-gray. The abdomen fawn color, with the hairs of the hind portions of segments whitish. The anterior wings are fawn color, tinged with reddish from the base to the middle; a broad ferruginous brown shade crossing the nervules, and composed of three lines having between them two rows of indistinct, fawn-colored spots; marginal space grayish at the tip, and obscure purplish toward the interior angle; a ferruginous brown line across the middle of the disk, and another, rather indistinct, near the base. Posterior wings ferruginous, deepening to a ferruginous brown narrow border, on the excavated portion of the hind margin; fringes whitish.

Mature Larva. Head green, with a narrow, central, brownish line. Body green, deepening on the sides and whitish on the dorsal region, with six oblique, irregularly oval, lateral whitish bands; stigmatæ orange; horn bluish-green. A variety is represented by Abbot & Smith in which the green color is replaced by pale ferruginous and the bands the same; horn dark brown. (*Abbot & Smith.*)

Pupation. Undergoes the larval transformation in an imperfect cocoon on the surface of the ground. Abbot & Smith represent that in Georgia the first brood enter the pupa state about the middle of May and appear as perfect insects during the middle of June; another became a pupa September 16th and an imago on April 16th following.

Food-plants. Azalea nudiflora. (Abbot.)

Georgia; Massachusetts; Connecticut; New York.

CLEMENS.

2. **D. myron** *Cramer*, III, 91, pl. 247. *Sphinx pampinatrix* Abbot & Smith, I. *Otus cnotus* Hübn. *Chærocampa pampinatrix* Harris. Figured in Cram. pl. 247.

Head, palpi, prothorax and tegulæ dull dark green; a whitish patch at the base of anterior wings, the tegulæ beneath edged with whitish and a triangular whitish line on dorsum of thorax. Abdo-

men dull greenish. Anterior wings dull pale green from the base to about the middle, with discal spot and a moderate band across the middle of disk dark green; a broad dark green shade across the nervules, divided in the middle by an indistinct lighter line, and deeply excavated posteriorly, where there is a dull greenish cinereous marginal patch. Posterior wings ferruginous, with a dusky green patch near the interior angle.

Mature Larva. Head pale green, with an indistinct, lateral yellowish line. Body pale green, inclining to yellowish and deepening in color beneath the subdorsal lines, which are greenish-white, and curve on the sides from first segment to base of caudal horn, with seven irregularly oval, greenish-white patches inclosing orange-colored stigmatæ and bordered beneath with dark green. There are several small crimson vascular spots on the dorsum. Sometimes reddish-brown, and the subdorsal lines and lateral patches tinged with reddish. Horn reddish-brown, with black tubercles.

Pupation. Transforms on the surface in an imperfect cocoon. *Pupa* luteous with the wing-cases brown and dotted with lines of black dots; eye-cases black; abdomen with the incisions between the segments black and round black lateral spots. The fall brood of larvæ enter the pupa state from the latter part of August to the middle of September.

Pennsylvania; Massachusetts; Georgia; New York.

CLEMENS.

3. **D. pholus** *Cramer.* Figured in Cram. I, pl. 87.

Rufescent. Fore wings blackish-brown, with a gray triangular discal patch; a fawn-colored patch on the median nervules and a red submarginal line, with two marginal brown bands, one arising on the costa at about the origin of post-apical vein, and the other near the margin itself. Posterior wings red, paler towards the base.

West Indies.

Tongue scarcely one-half as long as the body. Anterior wings excavated behind the tip.

CLEMENS.

4. **D. versicolor.** *Chærocampa versicolor* Harris, p. 303, 3.

Pale green varied with olive and whitish. A white line on each side of the head, a dorsal white line, tinged with reddish and extending from the head to the tip of the abdomen; prothorax and

edges of tegulæ above and beneath margined by white lines. A metathoracic spot on each side, and the middle of the abdominal segments tinged with dark buff, with the hind margins of the segments dark green from the base to the middle and thence to the tip reddish-brown. Anterior wings slightly ferruginous at the base, with narrow olive-green and dull white bands, the latter slightly tinged with ferruginous, arising at the inner margin of the base and curving to the costa from the basal portion of the disk to beyond the origin of post-apical nervule; an oblique whitish apical line with an olive-green patch adjoining and before it, in the post-apical interspace, and the line edged with olive-green in the apical interspace. Hind wings rust colored, with an indistinct, greenish terminal margin. *Under surface* of anterior wings pale sulphureous; toward the base pale ferruginous, with an olive streak along the costa from the base widening toward the tip. Posterior wings olive-green powdered with white at the base.

Massachusetts.

CLEMENS.

GROUP II.

Proboscis moderately long. Wings long, rather narrow. Fore wings slightly acuminated, convex in front toward the tips; exterior border slightly convex, very oblique; interior border slightly concave from half its length to the interior angle. Hind wings hardly acuminated.

5. D. rhodocera *Walker*, p. 184.

Fawn color, paler beneath. Sides of the head and of the thorax whitish. Antennæ rose color above. Abdomen paler than the thorax, with a blackish spot on each side at the base. Fore wings with a cinereous tinge, with an oblique exterior line, with a brownish discal dot, and with two diffuse ferruginous spots, one in front, the other behind; ciliæ ferruginous. Hind wings blackish, whitish about the interior angle; ciliæ mostly whitish. Length of the body 17 lines; of the wings 36 lines.

St. Domingo.

CLEMENS.

CHŒROCAMPA Dup.

The body in this group is slender, long and tapering. The thorax is smooth, rather short, advanced in front of the base of the anterior wings and tapers on the sides to the head. The head is rather large, prominent and moderately broad; the front smooth, conical and broad; the eyes moderate and salient; the palpi ascending to a level with the front; the tongue extends to the end of the abdomen; the antennæ are short, but longer than the thorax, clavato-prismatic, terminating suddenly in a short hook and seta. The abdomen is quite long, more than twice longer than thorax, oblanceolate, tapering very much to the tip, which is acute. The wings are narrow, the anterior three times longer than broad across the inner angle, and the length much less than that of the body; the tip very acute, the hind border very oblique and nearly straight or slightly excavated beneath the tip. Hind wings, the tip somewhat acuminated, hind border very oblique, and interior angle well marked. The legs are long and slender, the anterior tibiæ hairy, and hind tibiæ with four moderate spurs.

Larva. The head is small and the anterior segments very much attenuated from the third, and retractile; third and fourth swollen, with a large subdorsal ocellus on the latter, followed by a row of ocelli, similar; eleventh segment with a caudal horn (*Abbot & Smith*). The larval transformation takes place in an imperfect cocoon spun on the surface of the ground.

1. **C. tersa** *Drury.* *Theretra tersa* Hübner. *Chærocampa tersa.* *Metopsilus tersa* Duncan. Figured in Drury, I, pl. 28, Nat. Libr. vol. xxxvi. pl. 5.

Palpi pale ferruginous beneath; head and thorax brownish olive, with a lateral whitish line inclining to roseate on the sides; tegulæ slightly edged above with ferruginous. Abdomen with a broad, dorsal, dusky band, containing five indistinct darker lines and lateral band on each side, rusty yellow. Anterior wings greenish brown, slightly glaucous toward the base, with a minute discal spot, dark brown, and with numerous oblique, alternate,

dark brown and yellowish lines, extending from near the base and middle of inner margin to the tip, with a straight, brownish, submarginal line. Posterior wings black, with a row of subterminal yellow spots.

Mature Larva. Light green, with a large, subdorsal, crimson ocellus on the fourth segment, containing a blue ring and edged with black and white rings, with six others smaller and similar, placed on a white subdorsal line, which begins on the second segment and extends to the crimson caudal horn. The dorsum is dashed with brown points; stigmata yellow dotted with black points above and below. (*Abbot & Smith.*)

S. America; Mexico; W. Indies; Southern States; Illinois; Ohio; Texas.

CLEMENS.

2. **C. chiron** *Drury*, I, 50, pl. 26. *Sphinx nechus* Cramer. *Theretra nechus* Hübner.

Green, sometimes ferruginous fawn-color; a line on the sides of head and thorax and body beneath whitish testaceous. Fore wings dark green; with a pale yellow streak at the base of the inner margin, and an irregular, oblique brown, or testaceous band traversing the lower part of the nervules, enlarging toward the inner margin and extended above on it as a line. Posterior wings black, with a band of pale yellow spots. Abdomen green, slightly gilded on the sides, with a double row of black dorsal dots. Legs very long.

S. America; Mexico; West Indies.

CLEMENS.

§§ *Fore wings very acute and somewhat hooked.*

3. **C. falco** *Walker*, p. 132.

Fawn-colored, whitish testaceous beneath. Head and thorax with a whitish stripe along each side. Disk of the thorax cinereous brown. Abdomen brown, with a fawn-colored stripe along each side, and a double dorsal whitish line. Fore wings with blackish speckles, with a blackish discal dot and with several blackish, slightly oblique, posterior lines, slightly hooked and more acute at the tips than in the other species of this genus. Hind wings with two blackish stripes; exterior border slightly emarginate. Length of the body 15—19 lines; of the wings 30—40 lines.

Mexico.

CLEMENS.

§ *Hind border of anterior wings nearly straight.*

4. C. procne *Clemens.*

Head and thorax dull brown (if not faded), with a broad whitish stripe on the sides, extended to the lower edge of tegulæ. Abdomen brownish testaceous, with faint dark brown dorsal marks in atoms. Anterior wings rather pale brownish, punctated with dark atoms and with obscure dark brown lines extending from the base to the tip; discal spot dark brown and small. Posterior wings uniform blackish-brown. Under surface of the wings brownish, somewhat tinged with rufous, and with two rows of brown spots in the middle of the posterior.

California.

CLEMENS.

§§ *Fore wings very acute and somewhat hooked.*

5. C. drancus *Cramer*, II, 56, pl. 132. *Xylophanes drancus* Hübner.

Blackish-brown; sides of head and thorax with a white line, and a white dorsal line extending from the head to tip of the abdomen; tegulæ edged above with reddish-brown, beneath with white. The base of abdomen with two reddish-brown bands. Anterior wings blackish-brown, discal spot black; several lines extending from the inner margin to the tip, three of which in the middle of the wing arise from a blackish patch on the inner margin placed on a fawn-colored ground and a single black, subterminal line placed between two dark brown lines. Posterior wings uniform dark brown. (*Cramer's figure.*)

West Indies.

CLEMENS.

§§ *Anterior wings acute and somewhat hooked.*

The following species resembles in some respects Mr. Walker's *crotonis*, but I think it is not the same.

6. C. nitidula *Clemens.*

Head and thorax with a rufo-whitish line on each side. Head and anterior portion of tegulæ dark brown, tinged with greenish, with the disk brown. Abdomen brown, paler on the sides, with a double row of dorsal dark brown dots and a black patch on the sides at the base. Anterior wings dull greenish-brown, with a

large black spot on the inner margin near the base; discal spot small and black; *a single brownish line from the inner margin to the tip;* with two rows of indistinct brownish dots on the nervules before it, and a more decided row behind, near the posterior margin. Posterior wings black, with a row of central, pale testaceous, triangular spots, and a narrow terminal border of the same hue.

Under surface of the wings, disk of the anterior blackish, and thence rufescent brown; posterior wings rufescent brown, with two lines of dark brown dots.

Mexico.

CLEMENS.

§ *Hind border of anterior wings nearly straight.*

7. C. versuta *Clemens.*

Head and thorax brown. Abdomen brown, with black rings between the basal segments and a black spot on each side of the basal segment. Anterior wings brown with a faint wavy line and narrow band across the middle of the disk, somewhat deeper brown; discal spot small and dark brown; an oblique brownish band extending from the origin of subcosto-inferior vein toward the inner angle, followed by two short lines of the same hue; a blackish-brown, irregular, wavy line, extending from the costa near the origin of the post-apical vein to inner margin above the angle, and another of the same hue joining it by an angle on the disco-central vein, and extended very irregularly from near the tip to the inner angle, and shaded toward the hind margin of the wing with dark brownish. Posterior wings dark brown, dull greenish at the base, with an irregular, central, luteous band, tinged with orange.

Mexico.

CLEMENS.

AMBULYX Boisd.

Body rather slender or hardly stout. Head prominent, conical, obtuse. Proboscis long. Antennæ minutely serrated. Abdomen long, oblanceolate. Legs slender; hind tibiæ with four very long spurs. Wings narrow and very long, especially in the typical species, *A. strigilis*. Fore wings slightly curved in front toward the tips, which are acuminated; exterior border excavated by the tip, nearly straight, and extremely oblique from thence to the interior

angle, where the interior border forms an inward curve; second inferior vein (*superior*) nearly twice further from the third (*posterior*) than from the first (*disco-central*); third more than twice further from the fourth than from the second. Hind wings somewhat emarginate along the exterior border. *Walker.*

1. **A. strigilis** *Linn. Mant.* I, 558.

Pale fawn color, luteous beneath. Head with a furcate ferruginous brown spot between the antennæ and thorax, with two large lateral patches of the same hue. Antennæ white. Abdomen with a brown dorsal line and oblique brown lateral streaks, edged with testaceous. Anterior wings fawn color, with separated, oblique ferruginous streaks on the costa, four abbreviated, wavy blackish-brown lines crossing the middle of the nervules, a few spots on the inner margin, and a marginal black line (bordered above in Cramer's figure with blue). Posterior wings luteous or pale orange, with three angulated brownish lines and brownish terminal margin.

South America; West Indies.

CLEMENS.

2. **A. ganascus** *Stoll, Cramer*, V, 157, pl. 35, f. 3.

Fawn color; head with a band between the antennæ, the tegulæ and a band at the base of the abdomen dark greenish-brown. The antennæ white. Abdomen fawn-color, with brown or ferruginous dorsal spots. Anterior wings brown, with a glaucous hue; a rectangular spot on the base of the inner margin dark greenish-brown, edged with testaceous; a small round one at the base, two in the disk, another near the tip on costa, one in medio-posterior interspace and a small one above the interior angle of the same hue and edged with greenish. Posterior roseate, with three angulated blackish-brown bands sometimes dilated and somewhat connected.

South America; Mexico; West Indies.

CLEMENS.

PHILAMPELUS HARRIS.

The body is large and thick. The head rather large, free and prominent, with the front long, smooth, conical and rather broad; the eyes large or moderate; the palpi ascending and pressed closely to the front; the tongue as long as the body; the antennæ

long, exceeding the thorax, slender and tapering at the extremity into an ample hook with seta. The thorax is thick, moderately advanced in front of the base of anterior wings and rounded. The abdomen large, thick, cylindrico-conical and acute at the tip, more than twice the length of the thorax. The wings are moderately long; the length of the anterior somewhat more than that of the body, and about twice and a half longer than broad across the inner angle; the hind border entire, slightly excavated from the tip to medio-superior vein, and thence convex to interior angle, or very oblique and almost straight, with the inner margin deeply concave. The posterior are somewhat acuminated at the tips and the hind margin slightly excavated before the inner angle. The legs are long but strong, and the hind tibiæ with two short and two long spurs. *Male.*—Antennæ ciliferous. *Female.*—Antennæ simple.

Larva. The head is small and globose, and the segments of the body anterior to the fourth much attenuated to the head; these and the head are capable of being retracted within the fourth, which is much swollen. Instead of a caudal horn on the eleventh segment there is a shining lenticular tubercle, and the body at this part is rounded, and descends very abruptly to the anal shield. It is ornamented with irregularly oval, stigmatal patches and a faint subdorsal line.

In repose, or when disturbed, the anterior rings are retracted within the fourth, causing it to appear truncated and bulbous anteriorly, and at the same time the body is thrown into a sphinx-like posture. The larval transformation is subterranean.

The pupa is cylindrico-conical; head-case distinct and prominent; tongue-case not apparent.

§ *Eyes moderate. Fore wings undulating.*

1. **P. satellitia** *Linn.* Ins. II, 148, 36. *Sphinx lycaon* Cramer. *A. Pholus lycaon* Hübner. *Daphnis pandorus* Hübner. Figured in Drury, I, pl. 20.

Head, tips of the palpi and middle of thorax pale green, basal

articles of palpi brownish; tegulæ dark olive, forming a triangular patch; a dorsal line on prothorax and two metathoracic patches dark olive. Abdomen pale brownish tinged with green, with a dark olive patch on dorsum at the base and a lateral blackish patch on each side. Anterior wings pale green, with deep olive shades; a sub-median nearly square patch on inner margin, with a shade extending to the base, a patch above the interior angle, with a spot in the medio-posterior interspace separated from it by the nervule, and almost bordered by a faint line which is angulated on the medio-central, a sub-apical patch and a broad disco-median shade, all deep olive; a double blackish discal spot. The medio-central and posterior nervules and the space between the patches on the inner margin, tinged with roseate; a few olive-colored dashes across the disk and two lines of the same hue, sometimes faint, crossing the nervules from the hind portion of sub-median patch. Posterior wings pale green, with a large, round black patch toward the middle of inner margin, and a broad sub-terminal black demi-band terminating in blackish lines and a row of spots toward inner margin, on a roseate ground.

Mature Larva. Head green. Body pale green on dorsum, deepening on the sides, with minute dark green rings, which become on the dorsum dark green dots. Six short, irregularly oval patches on the sides, margined with a black line, inclosing the stigmatæ, which are bordered with pale crimson. The lenticular tubercle black and contained in a yellow patch bordered with black.

Food-plants. Indigenous and exotic grape-vines and *Ampelopsis*.

South America; Mexico; West Indies; United States.

CLEMENS.

2. P. achemon *Drury.* *Sphinx crantor* Cramer. *Pholus crantor* Hübner. Figured in Drury, II, pl. 20.

The head, tips of the palpi and disk of the thorax fawn-color with a grayish hue; basal articles of the palpi dark reddish-brown; tegulæ deep ferruginous brown, forming a triangular patch margined with whitish. The abdomen pale reddish-brown with a cupreous lustre, and the hind portions of the segments tipped with white. Anterior wings dusky fawn-color, sometimes pale-fawn color, with a ferruginous brown dot at the base, a square sub-me-

dian patch on the inner margin, a patch above the inner angle divided toward its apex by the medio-posterior nervule and a large sub-apical patch, ferruginous brown; from the sub-median patch two faint brown lines are thrown off posteriorly to the costa, the most exterior being angulated on the medio-central vein, and from its anterior portion are two other diverging brownish lines, with a faint line above them near the base of the wing; the disco-median shade is rather faint and brownish. The posterior wings are pink, deepening in intensity toward the middle of inner margin, and above the interior angle is a reddish-brown streak; a subterminal row of ferruginous brown spots from the middle to the interior angle, and a broad dusky terminal band. The under surface of the wings is roseate.

Young Larva. Green, with yellow lateral stripes edged with black, and a long, recurved, slender reddish horn.

Mature Larva. Head reddish-brown. Body pale reddish-brown on the dorsum, with a darker vascular line, and pale-reddish subdorsal line on each side, and the general color deepened laterally. Six lateral, short, irregularly-oval white patches bordered with black, containing the stigmatæ. The anterior rings are dotted with blackish. The lenticular tubercle is black, and contained in a brown patch edged with adjacent black and white lines.

Food-plants. The grape.

New York; Pennsylvania.

CLEMENS.

3. **P. typhon** *Klug*, Neue Schmett. pl. 3, f. 1.

Cinereous, reddish beneath. Palpi red. Thorax with two dark-brown abbreviated stripes. Abdomen with dark-brown bands, red on the sides. Anterior wings glaucescent and testaceous mixed, with several blackish-brown sub-trigonate patches. Posterior wings red, with a denticulated black band varied with glaucescent, with the exterior margin brown, and the cilia white.

Closely allied to *P. achemon.*

Mexico.

CLEMENS.

4. **P. labruscæ.** — *Madam Merian*, Ins. Sur. pl. 34.

Green, testaceous beneath. The abdomen sometimes, and rarely the whole body and anterior wings, testaceous. Abdomen with a

black spot at base on each side, beneath and at sides spotted with white. Anterior wings green, with two darker bands margined with white, one of which crosses the disk, and meets an oblique one on the inner margin. Posterior wings blue, with a black angulated band edged interiorly with red, and a sub-terminal black band breaking into black lines toward interior angle on a reddish ground; terminal margin testaceous.

S. America; Mexico; West Indies.

CLEMENS.

§§ *Eyes large. Fore wings nearly straight.*

5. **P. vitis** *Linn. Merian*, Ins. Surin. *Philampelus hornbeckiana* Harris, p. 299, *note.* (?) Figured in Drury, I, pl. 28. Cram. pl. 267. Sm. Abb. I, pl. 46.

Head and thorax grayish tinged with greenish. Thorax with a dorsal dark olive line, tegulæ dark olive, edged with white. Abdomen dark olive, paler on the sides, with a pale dorsal line; a blackish patch on the sides at base, and a dark olive dorsal patch at the base. Anterior wings deep olive, with a double whitish transverse line toward the base, a pale buff-colored band (in faded specimens white or whitish), extending from the base to the tip, crossed by another of the same hue from the lower third of inner margin to costa, beyond the origin of post-apical vein, and containing posteriorly a dark olive line; the nervules of the median nerve pale flesh color, or whitish, when faded; discal spot double and black. Posterior wings pale-green, pale-yellowish along the costa, with a central black line terminating in a black patch, near the middle of inner margin, and a sub-terminal black band tapering to interior angle; the inner margin rose-red, inclosing above the interior angle a whitish spot; terminal margin cinereous.

Mature Larva. Head reddish, with two black lines in front. Body flesh color mixed with yellow, and with short, transverse black lines. The lateral semi-oval bands are yellowish-white, edged with black. Body beneath the stigmatæ is greenish, with black lines and stigmatal blackish dots on the three anterior segments; lenticular tubercle blackish with dorsal black lines. *Abbot and Smith.*

Pupation. According to *Abbot and Smith*, it enters the pupa state August 14th, and appears as an imago September 7th. Another became a pupa September 29th, and appeared July 18th following.

Food-plants. *Jussieua erecta* (*decurrens*)?

S. America; Mexico; West Indies; Southern U. States.

CLEMENS.

The following species approaches *P. vitis* so nearly in its ornamentation, that I am much disposed to place it as a variety. But for the present, perhaps, it is better to represent it as distinct.

6. **P. jussieuæ** *Hübner.* *Sphinx fasciatus* Sulz.

Pale buff, tinged with reddish. Head and thorax with a dorsal olivaceous green line. Thorax with two broad olivaceous green stripes. Abdomen with two black spots at the base on the sides, and two dorsal olivaceous green stripes. Anterior wings olivaceous green, costa reddish-brown, with a discal mark, a transverse streak near the base, with two connected bands along the middle, and the veins pale buff; exterior margin reddish-brown. Posterior wings pale-green, rosy along the inner margin and exterior half of terminal border, with two black spots near the middle of inner margin, and a sub-terminal black band ending in short lines, and a dusky patch at inner angle.

S. America; West Indies; Mexico.

CLEMENS.

PACHYLIA WALKER.

The body is large and thick. The head is large, free and prominent; the front smooth, long, broad and elliptical: the palpi ascend to its level; the eyes are large or very large, salient and hemispherical; the tongue strong and thick, but when unrolled extends only to about the third abdominal segment; the antennæ are about as long as the thorax, with a long hook, compressed laterally. The thorax is smooth, immaculate, thick and cylindrical, well advanced in front of the base of anterior wings, and tapering on the sides to the head. The abdomen is large, nearly cylindrical or oblanceolate, generally rather more than twice the length of the thorax. The wings are about equal in length to that of the body, or somewhat longer, and about twice and a half longer than broad across the inner angle; the hind margin of the anterior entire,

almost obliquely convex, but slightly excavated near the tip and above inner angle, or more decidedly excavated and rounded in the middle, with the tip acuminated; the inner margin deeply concave above inner angle. The posterior wings are suddenly curved above the tip, and the hind margin slightly denticulated, or almost straight. The legs are strong and moderately long, the posterior tibiæ having two very short external and two long internal spurs. *Male*, antennæ prismatic and well ciliated. *Female*, antennæ simple.

The specimens of the perfect insects of this genus in my possession most undoubtedly show strong affinities to that of *Philampelus*. I am at a loss to conceive wherein Mr. Walker can perceive any affinity to *Macroglossa*, unless it be in *resumens* and *inconspicua*. These species I have never seen, and the generic diagnosis given above cannot, therefore, include any structural peculiarities which may characterize them.

1. P. ficus *Merian*, pl. 33.

Pale luteous brown, varied with dark brown. Head, thorax and palpi dark brown. Abdomen pale brown on the sides and between the basal segments; the two basal segments banded with blackish-brown. Anterior wings luteous-brown, with dark brown markings; a patch at the base and a single line nearly joining it, three wavy lines crossing the middle of the disk, a conspicuous discal spot, a patch near the origins of medio-superior and central nervules, a small patch on the inner margin beneath it, consisting of three short lines, the most posterior of which is the continuation of the upper of three separated, denticulated lines curving across the middle of the nervules. A semi-oval, apical, pale, greenish-brown patch, pointed on the tip and bordered beneath by a dark brown triangular shade, the tip of which reaches the medio-central nervule on the margin. Posterior wing pale luteous, with a broad central black band and a broad marginal band of the same hue tapering towards the inner margin, with an indistinct line of the same hue above it; inner angle covered with niveous scales.

Mexico; West Indies; S. America.

CLEMENS.

I think the following is the male of *P. ficus*. Should the conjecture be wrong, I would propose for it the name *P. lynceu*.

Bright pure brown somewhat tinged with ferruginous. Thorax with a purplish reflection. Palpi beneath white. Abdomen paler than thorax, pale yellowish on the sides and between the basal rings. Anterior wings with a paler rather broad stripe near the base containing a dark brown line and indistinct lines of the same hue crossing the middle of the disk; discal spot conspicuous, ferruginous brown, with three separated, denticulated, rather indistinct dark brown lines crossing the middle of the nervules; a semi-oval, apical, pale luteous patch, bordered beneath by a triangular ferruginous brown shade, with a pale purplish patch at the interior angle. Posterior wings ochraceous, with a central black band not extended to costa, and a marginal blackish band tapering toward the inner angle, bordered above by a series of black dots on the nervules continued as a line toward the inner margin; the inner angle covered above with niveous scales. The wings beneath ochraceous, both anterior and posterior with a row of sub-terminal blackish dots and the latter with a faint central dark line.

From the Smithsonian Institution. Capt. Pope's collection in Texas.

CLEMENS.

Anterior wings rather narrower than the preceding, more pointed at the tip and the hind border more distinctly sinuous.

2. **P. inornata** *Clemens*. *Sphinx ficus* Cramer.

Dull greenish-brown or dark reddish-brown. Abdomen rusty brown on the sides. Anterior wings in the ♀ with an olivaceous hue toward the base and somewhat purplish posteriorly. A pale brownish nearly semi-circular patch on the middle of costa extending beneath to the medio-superior and behind to the post-apical nervule; this is bordered by a broad umber brown band, which sends off to the middle of inner margin a short band of the same hue. There is only one distinct denticulated umber-brown line crossing the middle of the nervules, and is sometimes obsolete. A semi-oval, apical pale brown patch, tinged with dull greenish and bordered beneath by a triangular umber-brown shade. Posterior wings nearly concolorous umber-brown, or deep reddish-brown,

deepened to an obscure marginal blackish band. The inner angle curved above with niveous scales.

Honduras and Brazil.

CLEMENS.

3. **P. resumens** *Walker*, p. 190.

Fawn color, paler beneath. Abdomen with a black band on each of the three basal segments; the four following segments with two black spots on each. Fore wings with several undulating transverse brown lines, with a brown discal dot, and with three brown dots near the interior angle; exterior border cinereous. Hind wings paler, with a black discal stripe, which is connected at the tip of the wings with a black marginal stripe. Length of the body 17—18 lines; of the wings 40—42 lines.

Var. β.—Cinereous brown. Hind wings dull pale fawn color, greenish toward the base.

S. America; Honduras; West Indies.

CLEMENS.

4. **P. inconspicua** *Walker*, p. 190.

Fawn-color, testaceous beneath. Abdomen with two rows of black dots, and toward the base with two interrupted black bands. Fore wings with three undulating oblique blackish lines, a little darker between the third line and the exterior border. Hind wings a little paler than the fore wings, with two dark brown stripes, the one discal, the other marginal; a brown undulating line between them. Length of the body 21 lines; of the wings 48 lines.

Jamaica.

CLEMENS.

MACROSILA WALKER.

Size large, or very large, body thick and long. The head is large, free and advanced; the front very broad and long, tapering but little to the tips of the palpi; the eyes very large and salient; the antennæ clavato-prismatic, with a short hook and seta; the palpi very thick and ascending, and pressed against the front; the tongue twice or nearly twice the length of the body, or about *one-third* longer. The thorax is large and thick, somewhat rounded

in front, and tapering moderately on the sides to the head. The abdomen is tapering and cylindrico-conical, at least twice the length of the thorax. The wings are long, entire; the anterior rather broad across the inner angle, which is dilated, the hind margin obliquely convex, sometimes slightly wavy, and the interior margin with a long concave excision. The legs are long and strong, the posterior tibiæ having four very long spurs.

This group is very closely allied to Sphinx by the characters of the perfect insect, and I have hesitated much whether to restrict its limits as described by Mr. Walker, or to extend it. The general agreement in the length of the tongue of such individuals here included as I have been able to examine, has led me to take the latter course. This will doubtless be regarded as objectionable, but I think a greater degree of clearness of arrangement is attained. Under any arrangement portions of the two groups as compared to each other do not present well-marked or decided differences, and if some of the members of the present one strongly recall that of Sphinx, one member of the latter reproduces in its structure most of the peculiarities of Macrosila.

CLEMENS.

1. **M. collaris** *Walker*, p. 201.

Hoary, white beneath. Thorax dark-brown in front, and with some brown marks on each side. Abdomen with a much interrupted, middle, brown line, and with transverse, brown spots along each side. Wings brown beneath. Fore wings with a white discal dot, and with oblique, undulating, transverse, brown lines; also with a testaceous streak which extends from the base to an oblique, undulating, testaceous band. Hind wings brown, whitish at the base and along the anterior border, and with two hoary bands. Length of the body 18—19 lines; of the wings 42—46 lines.

West Indies.

CLEMENS.

2. **M. hasdrubal** *Cramer*, pl. 246, f. F.

Somewhat hoary. Head and thorax grayish-brown, the latter with a black streak on the upper edge of tegulæ. Abdomen with indistinct, lateral, blackish patches, edged before with whitish.

Fore wings with a black streak at the base, with two wavy, black lines crossing the posterior part of the disk; black marks on the costa, and marginal black spots and a series of dots on the median nervules. Hind wings blackish-brown, white along the interior angle, with brown undulating lines. *Male.*—The anterior wings principally brown. (Smaller than the ♀ with the black lines more distinct. The under surface in both ash-gray, with two brown bands.—*Poey.*)

Mature Larva. Gen. Char.—Head large. Body nearly uniformly cylindrical, with anal shield, broad and truncate at the extremity. Caudal horn *extremely long, slender, and membranous.*—Head reddish-brown. Body black, with nine or ten bright yellow, transverse bands on the middle of the segments. The first segment, the prolegs and a spot, whence rises the caudal horn, reddish-brown, dotted with black. (*Poey's fig.*)

Pupation. The larval transformation takes place on the surface, where the pupa is covered simply by the superficial debris. The pupa is represented without the detached tongue-case. (*Poey.*)

Food-plants. The larva feeds on a species of *Plumieria.*

South America and Central; West Indies.

CLEMENS.

I think it doubtful whether Cramer's *M. hydraspus* and *medor* are the same species, but having no specimen of the former, I am unable to determine the question. The general markings of the anterior wings are very similar, but *hydraspus* has *three white spots* on each side of the posterior abdominal segments, besides the three yellow spots on the basal rings. This is a peculiarity neither of the male nor female *medor* of Cramer.

Prof. Poey regards his *M. duponchel* as differing specifically from *medor* of Cramer, and *antaeus* of Drury. His figure, however, does not differ from a specimen in the Acad. Nat. Sciences from Jamaica, nor from a Mexican specimen in my own collection, except that the latter is much larger than either, and the subterminal line in Poey's figure is more distinctly edged with white.

The third article of palpi a small terminal hook; anterior wings slightly wavy.

3. **M. antæus** ——. *Merian*, f. 2. *Sphinx hydraspus* Cramer, f. A.(?) *Sphinx medor* Cramer, f. A. *Sphinx jatrophæ* Fabr. 18; Mant. Ins. II. 94, 21; Ent. Syst. III, 1, 362, 22. Gmel. Syst. Nat. I, 5, 2376, 63. *Cocytius jatrophæ* Hübner. *Amphonyx duponchel* Poey.

Palpi blackish-brown, beneath yellowish-white. Head, thorax, and abdomen, blackish-brown, intermixed with gray atoms; tegulæ with a black streak, edged beneath with whitish; abdomen with a dorsal row of black spots, and three large yellow spots on each side at the base edged with black, and black spots from the last to the tip of abdomen. Anterior wings blackish-brown, sprinkled with grayish scales; a grayish spot at the base, with a double, angular, black line crossing the middle of disk to the upper third of inner margin, and two or three serrated lines of the same hue on the middle of the nervules, and a subterminal black line curving from the costa, near the origin of post-apical to near the inner angle, and edged anteriorly rather broadly with brownish-gray; black circlets on the ends of posterior nervules, and a broad black apical streak; black streaks in medio-central and posterior interspaces, and two discal whitish spots, one near the sub-median nerve, and the other near the sub-costal. Posterior wings transparent in the middle, with black nervules and a broad, terminal, black border, with indistinct, grayish spots above inner angle; yellow at the base. Beneath, the body is whitish, with abdominal blackish spots; and the wings yellowish toward the base.

South America; Mexico; West Indies.

CLEMENS.

4. **M. cluentius** *Cramer*, I, 124, pl. 78, f. B.

Grayish-black, testaceous beneath; antennæ testaceous. Thorax fawn-color on the sides. Abdomen black, with a broad cinereous stripe, and several luteous spots on the sides. Anterior wings with numerous black spots or marks on the costa and inner margin, and semicircular black marks on the ends of the nervules, with a subapical streak and stripe behind, fawn-color. Posterior wings black, with an interrupted median stripe, and the interior margin luteous.

South America; West Indies.

CLEMENS.

5. M. rustica *Cram.* IV, 21, pl. 301. *Acherontia chionanthi* Hübner. Figured in Sulz. pl. 20. Cram. pl. 301. Sm. Abb. pl. 34.

Head and ends of palpi blackish-brown, with a short white dash on the vertex, and white spots at the base of the antennæ; palpi beneath white. Thorax blackish with white spots on the disk, and tegulæ at the base of anterior wings. Abdomen blackish-brown, with a narrow blackish dorsal line, and three round orange-yellow spots margined with black on each side, and two rows of dorsal white spots. The under surface of the thorax and abdomen is white. Anterior wings blackish-brown, or ferruginous brown, when faded, mottled with white; a few white spots at the base; the middle of disk crossed by two black lines and a brown one, which is margined on both sides with white, with serrated black lines traversing the nervules, margined broadly behind with brownish-white; discal spot white, an irregular sub-terminal blackish line, with white marginal spots and a short, oblique, apical streak, edged above with white; ciliæ white spotted. Posterior wings blackish, costa and disk yellowish, with a white spot near the base, and one above the inner angle crossed by black lines.

Mature Larva. Head and body dark-green, the latter becoming yellowish on the dorsum and sides, with faint greenish lines; thoracic rings with wavy, reddish dorsal lines. Seven oblique lateral blue bands edged with purple, and beneath this a white band colored yellowish on its lower part. Horn yellow, with reddish tubercles. (*Abbot & Smith.*)

Pupation. Enters the ground to transform. Pupa dark reddish-brown, with long detached tongue-case applied to the breast by its point. It becomes a pupa in Georgia in July.

Food-plants. The fringe tree.

S. America; Mexico; West Indies; Texas; Georgia; Virginia.

CLEMENS.

6. M. instita *Clemens.*

Head and palpi blackish-brown. Thorax concolorous, rather rusty brown, with a small metathoracic black tuft. Abdomen black, with dispersed bluish scales along the dorsum, with the basal segment banded with brown, and three large orange yellow spots on the sides of the basal segments; beneath and between

these spots are short white marks. The legs and under surface of thorax blackish-gray, and whitish in the middle. Anterior wings are brown in the greater part, separated by an exceedingly irregular outline from a black costal portion covered with dispersed pale-blue scales, and which is dilated from the costa into an angular basal, a large nearly square median, and an apical irregularly-oval patch; the brown portion has two broad dilations toward the costa, both extending to the sub-costal nerve. The median black patch contains a small white discal dot, and is edged beneath and behind by pale-brownish. The post-apical nervule and sub-costo inferior are pale-colored, and toward the termination of medio-central and posterior nervules are four small black spots, two on either side of each. The fringes are brown, broadly spotted with black. Posterior wings are pale-brownish and grayish from the middle to the base, with a large black patch at base, two central black bands, and between the latter and the former an oblique demi-line; a moderate, black marginal band, having a bluish one in its centre. The fringes black, spotted with brown.

Honduras.

CLEMENS.

7. **M. cingulata** *Linn.* *Sphinx druræi*, Donovan. *Sphinx convolvuli*, Drury. Figured in Drury, 1, pl. 25. Cram. pl. 225. Sm. Abb. 1, pl. 32.

Head, ends of palpi and thorax cinereous, with a brownish tinge; palpi white beneath, prothorax with two blackish lines and tegulæ, with one central and one on superior margin of the same hue; metathoracic tufts black, with a few bluish scales. Abdomen brownish cinereous, with large rose-colored lateral patches, separated by black bands. Anterior wings grayish-brown, with a grayish spot at base, irregular dark-brown angulated lines crossing the disk, and discal spot whitish, ringed with blackish; three dark-brown lines curving across the middle of the nervules, and bordered posteriorly with brownish-gray, in which the last line is produced into points on the nervules; a row of dark-brown circlets on the posterior nervules, with a line of the same hue in post-apical interspace extended to the tip, and streaks of the same hue in the central and posterior interspaces. Posterior wings rosy toward the base, with a central black band and black demi-line above it, a grayish space posteriorly, and a broad marginal cinereous band, bordered above with black. Legs cinereous, thorax and abdomen beneath white.

Mature Larva. Head yellowish, with two brownish dashes on each side. Body blackish-brown, with a crimson vascular line containing anteriorly diamond-shaped blackish-brown patches; a crimson sub-dorsal line, and a wavy, yellowish stigmatical line, sending off just above the stigmatæ short-curved processes. Horn short, brownish, and white on the sides. (*Abbot & Smith.*)

Pupation. Pupa reddish-brown, with a detached cylindrical tongue-case that makes one turn and a half, and is applied to the breast. The larva transformation is subterranean. In Virginia, pupation began October 3d, and the imago appeared May 30th; in Georgia, it began August 20th, and the imago appeared September 11th. (*Abbot & Smith.*)

Food-plants. The sweet potato.

Mexico; West Indies; Texas; Georgia; Virginia; Pennsylvania.

CLEMENS.

8. **M. carolina** *Linn.* Figured in Drury, I, pl. 25.

Head, palpi, and thorax blackish-gray or brownish-gray; thorax grayish on the sides, with short black lines on prothorax, the middle and upper edge of tegulæ; metathoracic tufts black tipped with bluish, followed by two large black patches. Abdomen blackish-gray, with a double row of dorsal white spots, five nearly round orange-yellow spots on each side, with black bands between and intermediate white spots below. Anterior wings cinereous or brownish-gray, with a white spot at base; angulated, somewhat indistinct, blackish lines crossing the middle of the disk to the basal portion of the inner margin; discal dot white, with parallel, rather approximated, black lines crossing the middle of the nervules, an irregular subterminal black line and marginal whitish line; with a black line hooked below in post-apical interspace, and a short one at tip edged above with whitish and blackish shades toward the base of medio-central and posterior interspaces. Posterior wings gray, with a black spot at base, an oblique black demi-line, a double black central band, and a broad marginal blackish-gray band, having a black band in the middle and edged above with black. Under surface of thorax and abdomen gray, with a reddish-brown tinge.

Mature Larva. Downy, wrinkled transversely. Head and body dark green, the latter paler on the dorsum, with whitish dots;

lateral oblique white bands, edged above with bluish and short transverse black lines. Stigmatæ black, with a yellow point above and below, except the *first* and *last*, which are orange-yellow with a black central point, and all edged with blue. Shield and terminal prolegs edged below with yellow; caudal horn rust-colored terminally. Feet white, ringed with black.

Pupation. The larval transformation takes place in a subterranean cell. The pupa is dark reddish-brown, with a detached, cylindrical, rather thick tongue-case, not as much arched nor as long as that of 5-*maculata*.

Food-plants. The tobacco and tomato plants.

South America; Mexico; West Indies; and generally throughout the United States.

CLEMENS.

9. **M. quinquemaculata** *Steph.* *Phlegethontius celeus* Hübner. *Sphinx carolina* Donovan, XI, pl. 361.

Head, palpi, and thorax ash-gray; prothorax with three obliquely transverse black lines; tegulæ with a superior and short central black line; the lateral metathoracic tufts bluish in the middle, followed by a large black patch on each side. Abdomen gray, with a slender black dorsal line, with four or five orange-yellow spots on the sides separated by black bands, having white spots above and beneath. Anterior wings gray, varied with brownish in the middle and toward the tip, with oblique black lines on the inner margin beneath median nervure, and three of the same hue arising about the middle of inner margin and curving toward the inner angle within the submedian, and thence continued across the nervules toward the costa; a sub-terminal black and marginal white line, both limited anteriorly by the disco-central nervule; a short apical black line, one in post-apical interspace hooked below, a slender recurrent one in disco-central interspace, a double one in medio-superior and blackish shades in the central and posterior. Posterior wings whitish, with a black spot at base, a black demi-line, two central, separated, serrated black lines, and a broad brownish-gray marginal band, bordered broadly above with black. Under surface of the thorax and abdomen red-ash color.

Mature Larva. Head green, with a black stripe on each side. Body very dark green, with a black patch on first segment, and lateral oblique greenish-yellow bands, each meeting a stigmatal

stripe of the same hue, thus forming a series of angular bands on the sides. The stigmatæ are all black, except the *first* and *last*, which are orange-yellow. The feet and caudal horn black. Body dotted with numerous yellowish-green dots, and marked with short black lines above the lateral bands.

Pupation. The larval transformation is subterranean. The pupa dark reddish-brown, with a cylindrical, long and much-arched, detached tongue-case.

Food-plants. The tomato and potato plants.

Throughout the United States.

CLEMENS.

10. M. brontes? *Sphinx brontes* Drury, II, 52, pl. 29, f. 3.[1] Walker.

"The insect here described differs much from Drury's figure, and may be a distinct species."

Cinereous. Antennæ white. Thorax margined with black, with white on the sides. Abdomen with a median black line, and two angulated black streaks on the sides. Anterior wings with a white discal spot, with transverse angulated interior brown and exterior black lines, with an exterior undefined white band and streak behind, sometimes obsolete, and with exterior black streaks. Hind wings brownish, with three blackish streaks.

United States.

CLEMENS.

11. M. forestan *Cramer*, IV, 216, pl. 394.

Tongue *one-third* longer than the body.

Head and tips of palpi brownish gray, the latter beneath gray

[1] *Brontes* Drury. "The antennæ are white inwardly, but brown outwardly. The eyes large and black. The head and neck dark brown. Thorax and abdomen gray; on the hind part of the former are two small black spots, and on each ring two small black streaks. Anterior wings gray, with a white discal spot and a small white cloud next the tips; having several curved and indented black lines crossing them from the anterior to the posterior edges, some being faint and others very distinct. The fringes are brown, spotted with white. The inferior wings are of a very dark brown, but along the abdominal edges and corners are gray. Fringe like that of the superior wings. *Beneath*, breast white; abdomen white with four central reddish spots; anterior wings uniform, dark grayish-brown, with a narrow white streak at the tips. Inferior wings crossed by two faint lines and also of a dark grayish-brown."

From New York.

or whitish. Thorax with a black line in front extended on the sides to tegulæ, where it is bordered below with whitish. Abdomen brownish gray, with a lateral black angulated band on each side, sometimes a black stripe with dull yellowish spots. Anterior wings gray or hoary, more or less varied with green and pale brownish, with a black streak along the base of inner margin, several black angulated lines crossing the disk and angulated black lines crossing the base of the nervules; discal spot grayish, adjacent to which is a greenish-brown median patch; black streaks at the base of medio-central and posterior interspaces and blackish circlets on the ends of posterior nervules, with a black curved subapical line. Posterior wings nearly uniform blackish brown, with a whitish patch above the interior angle crossed by two or three black lines; sometimes with faint blackish transverse bands.

Collection Acad. Nat. Sciences, Philadelphia, and Mr. W. H. Edwards, of Newburg.

South America; Honduras.

CLEMENS.

SPHINX LINN.

The size is very large, large, or moderate. The body is long, tapering, and cylindrical. The head free and prominent, the front broad, long, and conical. The antennæ prismatic, a little longer than the thorax, with a short hook and seta. The tongue variable. The thorax advanced and tapering on the sides to the head. The abdomen somewhat more than twice longer than the thorax and sometimes nearly thrice. The wings are long and narrow; the length of the anterior exceeding that of the body, and about one-third as long as they are broad across the inner angle, with the tip acuminated, the hind margin entire and usually very obliquely convex, with the inner angle rounded and the inner margin nearly straight or slightly concave. The legs are moderately long and stout, the hind tibiæ with four very long spurs.

Larva. The head is large, semi-oval, and flattened in front. The body is almost uniformly cylindrical, smooth, and obliquely banded on the side, with an arching caudal horn, and the thoracic segments somewhat folded. The tongue-case of the pupa is short

and detached, but reposes upon the breast. It is contained in a subterranean cell.

GROUP I.

Size very large. Head large. Eyes large and salient. Tongue nearly twice as long as the body. Palpi thick, ascending and pressed against the front.

1. S. leucophæata *Clemens.*

Head, palpi, and thorax gray; tegulæ with a black line on the superior margin. Abdomen grayish, with a black patch on each side at the base and alternate black and whitish demi-bands. Anterior wings gray, with a small black patch about the middle of the base; an indistinct blackish double line arises at the base of the inner margin and extends to the origin of medio-central vein, and two lines of the same hue cross the lower portion of disk obliquely to about the same point; a blackish wavy line, curved toward the costa, and bordered beneath with pale gray, arises about the middle of the inner margin and extends to the lower part of disco-central nervule, whence it retreats indistinctly to the costa; a subterminal, angulated, abbreviated black line, bordered irregularly with pale gray. A deep black streak in post-apical interspace continued to the tip, and conspicuous black streaks at the base of medio-central and posterior interspaces; discal spot obscure and whitish; fringes gray. Posterior wings grayish, with a black median band and broad black marginal band, with a space on terminal margin from the middle to the inner angle, gray. Beneath, thorax ash gray, abdomen white, with a few brownish ventral spots.

Texas.

CLEMENS.

GROUP II.

Size large or moderate. The head moderate. The eyes small and but moderately salient. The tongue one-third longer than the body, or about as long or somewhat shorter. The palpi are thick and slightly exceed the front, with which the hairs of the tip are scarcely identified.

2. S. cinerea *Hübner.* *Lethia chersis* Hübner.

Head, palpi and thorax dark gray; tegulæ tipped with whitish terminally, with a black line on the superior edge and a short indistinct one above and parallel to it, and a metathoracic spot on each side. Abdomen dark gray, with a black dorsal line and alternate black and white lateral demi-bands. Anterior wings dark gray, with a black spot at base, a delicate black discal line; a black streak at the tip and in post-apical interspace, bordered above with pale gray, in sub-costo inferior, medio-central and posterior interspaces, and a slender black line in sub-median sulcus; a sub-terminal blackish line and one near the margin bordered below with pale gray and both abbreviated toward costa. Posterior wings sordid gray, with a broad median and a terminal black band.

Massachusetts; Wisconsin; Southern States.

CLEMENS.

3. S. sordida *Hübner.* *Agrius eremitus* Hübn. *Sphinx lugens* Walker, p. 219 ?[1]

Dark brownish cinereous. Head and thorax paler on the sides, with a rather broad blackish-brown stripe on the middle of tegulæ, extending to prothorax and edged above with two lines of the same hue, and with a brownish dorsal line on the disk of thorax; metathoracic spots, black. Abdomen with a dorsal black line and alternate black and whitish demi-bands on the sides; beneath white, with central blackish spots. Anterior wings brownish cinereous, with a black margined white discal spot, through which passes a short blackish discal dash, and a smaller one above it; with blackish-brown costal marks over the disk, the two most posterior of which reach to the discal spot and are joined or nearly joined at an angle by two more or less distinct lines from the inner

[1] *S. lugens.*—Blackish-gray, paler beneath. Head and thorax paler on each side. Thorax with two black stripes. Abdomen with interrupted white and blackish bands. Fore wings slightly tinged with brown, with black costal marks, and with discal and exterior streaks; two whitish discal dots, the fore one occasionally obsolete. Hind wings black, with two whitish undulating bands; ciliæ white. Length of the body 17—19 lines; of the wings 42—46 lines.

Mexico.

margin of the base; a broad diffuse blackish-brown apical streak with a costal line above it in apical interspace, and blackish-brown streaks in the interspaces, except the medio-superior; an abbreviated blackish-brown line edged exteriorly with grayish near the terminal margin. Posterior wings yellowish-white, with a black spot at the base, a median and broad marginal band black. Length of the body 16 lines; expansion of the wings 35 lines.

Var. A. *a male.*—Brownish, with two distinct dark brown lines from the inner margin of base and the middle of the costa, angulated on the disk; over the median nervules the wing is dark brown, with faintly indicated irregular lines crossing the middle of the nervules to the costa and grayish spots exterior to them. Length of body 22 lines; expansion of the wings 54 lines.

Near Jalapa, Mexico. Acad. Nat. Sciences, Philadelphia.

Var. B. *a male.*—Blackish cinereous; two distinct black angulated lines crossing the posterior portion of the disk from the inner margin of base; with a band of blackish-brown lines crossing the middle of the nervules. Length of the body 20 lines; expansion of the wings 47 lines.

Near Jalapa, Mexico. Acad. Nat. Sciences, Philadelphia.

CLEMENS.

Mr. Walker's *lugens* is probably one of these varieties of *sordida*.

Mexico; Texas; Massachusetts.

4. S. plebeia *Fabr.* Sp. II, 146, 31.

Head and thorax dark gray, with a transverse black line on prothorax continued to the tegulæ, which are pale grayish beneath it. Abdomen gray, with a slender black dorsal line and a black stripe on each side containing whitish spots. Anterior wings gray, with a short black stripe at the base of the inner margin, two very oblique, short black lines from the basal portion of costa to the disk, sometimes uniting with the line from the base on the disk, and two distinct serrated black lines crossing the middle of the nervules from about the origin of post-apical to the lower third of inner margin; black streaks in all the interspaces, that in medio-superior contained in a white streak, and short white streaks on the terminal portion of medio-central and posterior interspaces; discal spot white and the nervules tipped with blackish at their

ends. Posterior wings blackish-brown, grayish towards the base and the inner border, and sometimes faintly grayish in the middle.

Pennsylvania; Connecticut; Massachusetts.

CLEMENS.

5. **S. kalmiæ** *Abbot & Smith.* Figured in Sm. Abb. 1, pl. 37.

Head and thorax ferruginous brown, paler on the sides; tegulæ with a central and upper black line, metathoracic patches black. Abdomen ferruginous brown with a central black line and alternate whitish and black demi-bands. Anterior wings ferruginous brown, paler in the middle, with two oblique blackish streaks at the base of inner margin and very oblique ferruginous streaks from the costa to disk; a pale streak in post-apical interspace, margined on each side with ferruginous, and ferruginous and brownish streaks in the remaining interspaces, with a whitish line near the margin edged above with blackish; discal spot small and ferruginous; fringes reddish-brown. Posterior wings brownish-white, with a broad central and terminal black band; exterior margin reddish-brown and fringes of the same hue.

Mature Larva. Head green, with a lateral black stripe. Body fine pale green, deepening on the sides, with pale yellow, lateral, oblique bands edged above with black, which is again bordered with pale blue; first and second prolegs with a black spot on the sides; stigmatæ orange-yellow; shield and terminal prolegs dotted with numerous brown dots on a pale brownish patch; caudal horn blue, but thickly covered with black tubercles. Length about *three inches.*

Pupation. The larval transformation is subterranean. The pupa dark-brown; the tongue-case half as long as the breast and applied to it, with the extremity bulbous. The larva enters the pupa state during the latter part of August or in September, and appears as an imago in the following June or early in July.

Food-plants. I have found the larva nearly full grown on the *lilac* about the middle of July. Also feeds on the leaves of *Kalmia latifolia.* (*Abbot & Smith.*)

Canada; New York; Pennsylvania; Massachusetts; Georgia.

CLEMENS.

6. S. drupiferarum *Abbot & Smith.* Figured in Sm. Abb. 1, pl. 36.

Head and thorax blackish-brown, whitish fawn-color on the sides. Abdomen brown, with a slender dorsal line and a lateral black band on each side containing brownish-white spots. Anterior wings dark brown, with costa from base beyond the disk, and to median nervure below, whitish fawn-color, with wavy, separated dark brown lines crossing lower portion of the nervules, the last bordered above with whitish; a fawn-colored marginal space tapering to the tip and containing a whitish line. A black discal dash, and two delicate black discal lines continued singly on the disco-central nervule, with black streaks in submedian sulcus and all the interspaces except the medio-superior. Posterior wings whitish, with a broad median black band enlarged towards the costa and sub-terminal black band, with the terminal margin fawn-color.

Mature Larva. Head green, with a lateral blackish band. Body pale green, with lateral, oblique purple bands, edged beneath with white; caudal horn dark reddish-brown, yellow on the sides at base; stigmatæ orange-yellow. Length about $3\frac{1}{2}$ inches.

Pupation. The larval transformation takes place in a subterranean cell. The pupa is dark brown, with reddish-brown between the segments and the tongue-case short, reposing on the breast and truncate at the extremity. The perfect insect from the fall larva appears early in June.

Food-plants. The larva feeds on the leaves of the various varieties of *Plum.*

Pennsylvania; Massachusetts.

CLEMENS.

7. S. luscitiosa *Clemens.*

Antennæ blackish-brown. Palpi blackish-brown. Head and thorax blackish-brown or blackish and white on the sides. Abdomen brown, with a black stripe on each side. Anterior wings pale brown, with a ferruginous hue; the inner border fuliginous, a terminal fuliginous band tapering to the tip of the wing, with a wavy outline anteriorly, and the costa and a patch on the costa above the tip of the same hue; a slender black discal line, with black lines and streaks in all the interspaces and sub-median sulcus. Fringes blackish. Posterior wings yellow or stramineous, with a broad terminal black band and the fringes whitish.

Wisconsin; New York.

CLEMENS.

8. **S. gordius** *Cramer.* Figured in Cram. III, pl. 247.

Head and disk of the thorax blackish-brown or black and reddish-gray on the sides. Abdomen dark gray, with a dorsal black line and alternate black and grayish demi-bands. Anterior wings blackish-gray, with a roseate hue; discal spot conspicuous and white, a discal black line bifid toward the discal spot, with the usual lines and streaks in interspaces and submedian sulcus, black; a blackish-brown marginal shade, with pale grayish on the portion of the wing above it, at the base and the tip of the wing. Fringes dark brown spotted with white. Posterior wings gray, with a black median band, and a broad, black marginal band; the fringes white.

Mature Larva. Apple green, with seven oblique white lateral bands, slightly edged above with violet, a rusted caudal horn, and a brownish line on each side of head. (*Harris.*) There is almost too much resemblance in this description to the larva of *drupiferarum*.

Pupation. The larval transformation is subterranean; pupa with a very short detached tongue-case. (*Harris.*)

Food-plants. The larva feeds on the leaves of the apple-tree. (*Harris.*)

Maine; Massachusetts; Connecticut.

CLEMENS.

9. **S. jasminearum** *Le Conte, Sr.* Wilson, Treat. Ent. in Ency. Brit. pl. 236, f. 5, 6.

Palpi gray-brownish on the sides. Head and thorax pale gray, with a transverse black line on prothorax extended to the middle of tegulæ, with a black dash in the middle of the disk and metathoracic black streaks on each side of median line. Abdomen dull gray, with a black stripe on each side containing whitish spots. Anterior wings gray, with blackish-brown markings; a blackish streak at the base of inner margin, with two brownish lines from the disk to its lower end; two blackish-brown oblique lines or a broad oblique streak from the costa to the disk at the origin of median nervules; discal spot white, with a brownish discolored patch just posterior to it, extending from costa at the origin of subcosto inferior nervule to medio-posterior interspace, where it becomes a black spot, and continued thence to inner margin as two brownish lines; two doubly curved lines of connected spots crossing the middle of the nervules from near the origin of post-apical

to the lower third of the inner margin, with an irregular brownish line near the terminal margin; a long, decided black streak in medio-central interspace, with a blackish spot on the terminal margin of the medio-central nervule. Posterior wings nearly uniform blackish brown, with a faint grayish central band and a grayish patch above the interior angle.

Pupation. Larval transformation subterranean. The pupa is dark brown, with a very short cylindrical tongue-case bulbous at the extremity, and applied to the breast.

Food-plants. Mr. Newman, of Philadelphia, found a pupa of this insect beneath an isolated ash tree, under such circumstances as to render it probable that this is one of the food-plants of the larva.

Long Island; New York; Pennsylvania.

CLEMENS.

Length of tongue unknown.

10. S. coniferarum *Abbot & Smith.* Figured in Sm. Abb. I, pl. 42.

Cinereous; white beneath. Thorax with a brown stripe on each side. Abdomen cinereous without bands. Anterior wings, with a brown basilar, wavy line, a brown costal spot above the discal spot, which is blackish; with a crenated brown line crossing the middle of the nervules edged anteriorly with whitish. A long black streak in medio-central interspace, and a shorter one in the posterior, with the ends of the nervules tipped with blackish. Posterior wings brown. (*Abbot & Smith's figure.*)

Mature Larva. Head yellow with two black lines. Body gray, with three rows of dorsal, square, dark-gray spots, one of which is vascular, having a black dot at each angle, and a slender, whitish, vascular line, with whitish striæ between the square spots. First segment with two dashes and one subdorsal on each side. The larva is full grown about August 27th and Nov. 10th, which latter produces an imago in April following. (*Abbot & Smith.*)

Food-plants. Pinus palustris.

Georgia; Canada.

CLEMENS.

N. B. The specimen Dr. Harris described under this name, as I have ascertained from a photograph, was *E. harrisii.* This is probably likewise identical with *S. coniferarum.* The discovery of the larva of *harrisii* will remove any doubt respecting the identity of the insects.—B. CLEMENS.

ANCERYX Walker.

Body rather long and slender. The head large, free and prominent; the front broad, subconical, the vertex pilose or subtufted; the eyes large and salient; the tongue as long as the body; the palpi rather slender, scantily pilose and pressed against the front, with the terminal article *exposed*. Antennæ as long or somewhat longer than the thorax, with a short hook and seta. Thorax well developed anterior to the base of the fore wings, but rounded anteriorly, usually with a slight double crest on the fore part of the dorsum. Abdomen slender and oblanceolate, at least twice the length of the thorax. Legs long and slender, hind tibiæ with moderate spurs. The wings narrow and moderately long; the length of the anterior less than that of the body, and about three times longer than broad across the inner angle, the tip acuminated, the hind border obliquely rounded, but wavy between the nervules, the inner angle rounded and the inner margin moderately concave. Posterior wings rather acute at the tip, with the hind margin entire.

Head smooth, thorax scarcely crested.

1. A. ello *Linn.* Figured in Drury I, pl. 27. Cram. IV, pl. 301.

Head and thorax gray; the front of thorax and the vertex discolored with blackish, without distinct markings, with a black line on sides of thorax extending from the eyes to the base of anterior wings. Abdomen gray, with a dorsal gray band, containing a slender blackish line, and banded with alternate black and gray bands in both sexes. Anterior wings pale grayish, varied with blackish; with a blackish stripe extending irregularly from the base to the tip, and consisting chiefly of streaks between the nervules; base of the wing blackish, with a patch in costa over disk, and at the origin of subcosto-inferior nervule, and with a row of marginal black spots in the interspaces. Posterior wings rust red, with a broad, blackish brown, terminal band and a cinereous patch at the anterior angle.

The anterior wings of the specimens described are unfortunately worn.

Mature Larva. Head purple; body obscure brown, with a black dorsal line, and spotted irregularly with white on the sides; caudal horn purple. (*Merian.*)

Food-plants. The leaves of a species of *Psidium* or Guava. (*Merian.*)

South America; West Indies; Mexico; Texas; Southern United States; California.

CLEMENS.

Vertex and thorax with distinct double crests.

2. A. obscura *Fab.* sp. II, 142, 14. *Erinnys stheno* Hübner.

Hoary and somewhat bluish gray. Head and thorax dark gray and paler on the sides, the latter with a few short black lines, or with the disk before blackish brown, and a stripe of the same hue on the sides. Abdomen dusky gray *without bands*, and two brownish dorsal lines. Anterior wings hoary, or gray tinted with bluish, with blackish markings; a blackish streak extending from base to the tip, and a short, nearly parallel blackish streak above the interior angle; a blackish patch on costa at the posterior extremity of the disk, a fainter one about the middle, and another at the origin of the post-apical nervule; a row of black dots on the lower third of the nervures and another about the middle, each series being connected by a faint acutely angled line; a row of marginal, black dots in which terminate faint, slender, blackish lines in the interspaces from the post-apical to the medio-central. Posterior wings rust-red or reddish fawn-color, with a dark-brown patch on the terminal margin, about the interior angle, and a series of indistinct dots above the nervules.

In the markings of the anterior wings this species bears a very striking resemblance to *A. ello.*

Mexico; West Indies; Texas.

CLEMENS.

3. A. scyron *Cram.* IV, 23, pl. 301.

Hoary, cinereous. Thorax with a broad, anterior, blackish band, and two blackish, posterior, abbreviated bands. The segments of the abdomen with interrupted, blackish bands, separated and whitish. Fore wings dark brown, varied with yellowish, with

a few brown bands more or less definite and branched, sometimes almost obsolete. Posterior wings luteous, broadly margined with black, with a somewhat hoary patch along the interior angle.

South America; West Indies.

CLEMENS.

Thorax doubly crested.

4. **A. alope** *Drury*, I, 58, pl. 27.

Brown. Abdomen blackish, with hoary interrupted bands and a dorsal stripe. Anterior wings with a series of angular black lines about the middle of the nervures, with a paler streak near the middle of the inner margin, more or less bent backwards, sometimes blackish brown. Hind wings luteous or orange yellow, with a broad brown terminal margin.

Var. β. Female. Brown, cinereous beneath. Head and thorax with a blackish stripe. Abdomen hoary, with three slender black stripes and with broad black bands; tip fawn-color. Fore wings with indistinct blackish lines and streaks, and with some exterior fawn-colored streaks. Hind wings luteous, with very broad dark brown borders; exterior margin somewhat fawn-colored. Length of the body 20 lines; of the wings 39 lines.

S. America; West Indies.

CLEMENS.

5. **A. guttularis** *Walker*, p. 227.

Hoary, whitish beneath. Head and fore part of the thorax with a brown middle line. Abdomen with a slender whitish stripe, and with a slight lilac tinge. Wings beneath pale brown, white at the base and along the interior border of the hind wings. Fore wings with a black streak along the middle, and with several black dots. Hind wings brown, ferruginous at the base; ciliæ white. Length of the body 10 lines; of the wings 18 lines.

St. Domingo.

CLEMENS.

Thorax doubly crested.

6. **A. œnotrus** *Cramer*, IV, 22, pl. 301.

Cinereous, beneath white. The head is whitish, with the sides of a dirty rose color. The segments of the abdomen whitish, and white beneath, with black points towards the sides. Anterior wings reddish brown toward the base, with slightly fawn-colored

lines and streaks, sometimes with the margins brown in part. Posterior wings rufescent or reddish brown, with a terminal blackish brown band and a small cinereous patch at the interior angle.

S. America; Mexico; West Indies.

CLEMENS.

Hind margin of fore wings not denticulated, entire?

7. **A. caicus** *Cramer*, II, pl. 125.

Cinereous. Thorax with three blackish brown stripes. Abdomen with two dorsal black lines and broad interrupted black bands. Anterior wings with pale brownish and blackish brown lines in the interspaces, a blackish brown line on the inner margin and a white discal line. Posterior wings red, with black radii from the hind margin.

South and Central America; West Indies.

CLEMENS.

DOLBA WALKER.

Size moderate or small. The body is stout, and rather short. The head rather small, but free and moderately prominent; the front broad, vertical, rounded and obtuse; the eyes quite small and scarcely salient; the palpi nearly horizontal and equal to the front; the tongue somewhat longer than the body; the antennæ rather slender, with a short hook and seta, and about as long as the thorax. The thorax but little advanced anterior to the base of fore wings, tapering but little to the head and rounded in front. The abdomen rather conical, and about twice the length of the thorax. The length of the anterior wings rather more than that of the body, somewhat more than twice longer than broad, the tip rounded, the hind margin entire and oblique, somewhat prominent in the middle and slightly concave above the inner angle; inner margin slightly concave. Posterior wings obtusely rounded at the tip, hind margin entire and somewhat concave before the inner angle.

1. **D. hylæus** *Drury*. Figured in Drury II, pl. 25. Sm. Abb. I, pl. 35. *Sphinx prini* Abbot & Smith. *Hyloicus dynæus* Hübner.

Palpi white beneath. Head and thorax brownish ferruginous, and whitish on the sides, with two white dots on the disk of thorax

and two black metathoracic spots. Abdomen brownish ferruginous, with a row of dorsal brown spots and a double row of white spots, and with lateral alternate black and narrow white demi-bands. Anterior wings dull ferruginous, or dark brownish varied with white and blackish; a white spot at the base, with a blackish band, white margined towards the base, crossing the middle of the disk; discal spot white and black margined, a band of blackish lines crossing the middle of the nervules, margined posteriorly broadly with whitish, and black circlets on the posterior ends of median nervules; apical line black, white margined toward costa. Posterior wings whitish, with an indistinctly double, median blackish band, joined near inner margin by a blackish patch from the base and a broad terminal dark brown band edged above with blackish. Sometimes the wing is blackish brown, with a central white line and a fainter one above it, with white at the base.

Mature Larva. Head green, with a pale blue line on each side. Body pea green, with lateral oblique pink bands edged below with white; caudal horn crimson. (*Abbot & Smith.*)

Pupation. Pupa reddish brown; tongue-case not apparent. Pupation began May 17th, and the imago appeared June 19th. Another entered the pupa state August 25th, and appeared April 26th, in Georgia. (*Abbot & Smith.*)

Food-plants. *Prinos glaber;* Winterberry.

Mexico; Georgia; Massachusetts; Connecticut.

CLEMENS.

CERATOMIA HARRIS.

Size large. Body usually thick and long. The head small, nearly sessile, and somewhat depressed; front broad and almost vertical, pilose or sub-tufted; the eyes small and scarcely salient; the palpi rather short and slender, nearly horizontal and not identified with the front; tongue about one-third as long as the body, not as long as the thorax; the antennæ longer than the thorax, ending in a short hook with seta. The thorax is thick, sub-globose, but little advanced anterior to the base of the fore wings. The abdomen is cylindrical, tapering near the extremity, and nearly thrice or full thrice the length of the thorax. The legs stout and the hind tibiæ with two long internal and two short

external spurs. The wings are rather broad, the anterior with the tip rounded, the hind margin entire, obliquely convex, and the inner margin somewhat concave above the interior angle. *Male*, antennæ ciliferous. *Female*, antennæ simple.

Larva. Head large, semi-oval, somewhat flattened in front. Body wrinkled transversely and granulated, with a vascular line of fleshy serrations and a thoracic dorsal line of granulations on each side, and with four thoracic fleshy granulated horns; caudal horn rather short, straight, and roughened. The pupa is smooth; tongue-case not apparent. Transformation subterranean.

1. C. quadricornis *Hübn.* *Agrius amyntor* Exot. Schmett.

Palpi brown. Head grayish or whitish-fawn color. Thorax with the disk fawn color or greenish brown and whitish on the sides, a short transverse dark-colored line before and the tegulæ with a central and superior blackish line on each side, with black metathoracic spots. Abdomen fawn colored or brownish, with a slender black dorsal line and two black stripes on each side. Anterior wings fawn color, varied with blackish brown, or dull greenish brown varied with black; costa grayish at the base, with wing of a pale hue above the median nervure and dusky beneath it; three dark brown irregular lines advance from the basal portion of the inner margin to the disk beyond its middle, and thence retreat to the costa; discal spot white, with a short black discal dash resting on median nerve; several subterminal blackish lines arise above the interior angle and run nearly parallel to the hind margin to disco-central nervure, whence they retreat to the costa; black streaks in all the interspaces, with the fringes brown, spotted with white. Posterior wings pale brownish, with a subterminal blackish or dark-brown band and shaded with blackish in the middle or forming indistinct dark-colored lines.

Mature Larva. Head pale green, with an indistinct whitish lateral stripe. Body pale green, becoming just before pupation in one of the sexes more or less reddish brown, dotted with obscure granulations; lateral stripes pale greenish, with whitish granulations and two thoracic dorsal white granulated lines; caudal horn greenish; stigmatæ black encircled with yellow and divided by a yellow line. Feet reddish or tipped with reddish. Length about 3 inches.

Pupation. The larval transformation is subterranean. Pupa dark brown, smooth cylindrico-conical, tongue-case not apparent. The larva reaches maturity about the beginning of September, and appears as an imago during the following May or June.

Food-plants. The larva feeds on the leaves of *Ulmus americana*, the American Elm.

Massachusetts; Pennsylvania; Michigan.

CLEMENS.

2. C. repentinus *Clemens.*

Head and thorax dark gray, paler on the sides; prothorax with two black transverse lines, the first edged above with luteous scales; tegulæ with a central black stripe. Abdomen dark gray, pale gray on the sides, with a slender dorsal black line and with two black stripes on each side. Anterior wings pale or rather deep cinereous, varied with black and white; two black lines arise near the basal portion of the inner margin and cross the disk to the costa, sometimes indistinct or obsolete in the middle; a blackish costo-discal patch containing a short black discal streak; discal spot white and black margined; two distinct sets of double, serrated, undulating black lines cross the middle of the nervules, and are separated by pale grayish or whitish, with an irregular whitish line near hind margin; a black apical line margined with whitish, and black streaks in the two last median interspaces; fringes white, spotted with dark brown. Posterior wings blackish gray, with three parallel, narrow undulating black bands; fringes white, spotted with dark brown.

Food-plants. I have been assured by various collectors that the larva feeds on the *ash;* none of them, however, were able to describe it from recollection.

Michigan; Connecticut; New York; Pennsylvania.

CLEMENS.

N. B. This insect is probably *Sphinx brontes* of Drury. See page 191. (B. CLEMENS.)

SMERINTHUS LATR.

Size moderate or large. The body is robust and thick, with the tip of the abdomen turned upward in the males. The head is small, sessile, sometimes sunken and depressed; the front moderately broad, vertical, pilose or subtufted: the eyes small scarcely

prominent or visible from above; the palpi thick and short, but equal to the front; the tongue almost as long as the palpi; the antennæ usually without the terminal hook, without distinct seta, and about as long as the thorax. Thorax short, almost globose and but little advanced. The abdomen cylindrico-conical, more than twice longer than the thorax. Wings without bristle and hook. The anterior are longer than the body, and about twice as long as broad; the hind margin angulated opposite the post-apical vein and the medio-central, truncate at the tip and excavated between the angles, or denticulated along the hind margin; the inner margin is deeply concave above the interior angle, which is somewhat prominent. *Male*, antennæ densely ciliferous or subpectinated, with the articles produced beneath. *Female*, antennæ simple.

Larva. The head is semi-oval or pyramidal, with vertex acute. The body granulated, with a caudal horn, and obliquely banded with dorsal thoracic lines on each side. Transformation subterranean. The pupa of Group I. smooth and cylindrico-conical, and the position of the larva, when at rest or when disturbed, sphinx like.

Group I.

§ *Hind wings dilated on the costa at the tip.*

† *Fore wings angulated and excavated on the hind margin.*

1. S. myops *Abbot & Smith. Smerinthus rosaceorum* Boisduval. Figured in Sm. Abb. I, pl. 26, Boisd. Sp. Gen. pl. 15.

Palpi, head and thorax chocolate brown and the two latter portions with a purplish or rosy tinge; the sides of palpi and a stripe in the middle of the thorax tawny yellow. Abdomen brownish luteous, with irregular tawny yellow spots, and the hind portions of the segments dark brown. Anterior wings chocolate brown, with a faint purplish or reddish gray tinge towards the base; a small blackish spot at the base, between median and sub-median nerves; an indistinct brownish curved line crosses the basal portion of the disk, with a large, median, chocolate brown patch, with

its anterior margin darkest, inclined towards the anal angle, and joined at an acute angle by a patch of the same hue about the middle of sub-median nervure; one or two wavy sub-terminal brown lines, with an irregular chocolate brown band near the hind margin, extending from the tip to about the middle of the wing and thence to anal angle indistinctly; a dull yellow patch above anal angle, with blackish spots above it in sub-median sulcus, and another about the middle of apical interspace, with an angular, narrow, bluish line at the tip. Posterior wings dull yellow, with the costa and outer portion from near the middle, chocolate brown, and one or two short bluish lines above the tip and a dull yellow spot upon it; ocellus black, with a large pale blue pupil.

Mature Larva. From Abbot & Smith's figure; head bluish green, with a bright yellow line on the sides. Body bluish green with a row of sub-dorsal and stigmatal reddish brown spots; six oblique lateral bright yellow bands, with two thoracic sub-dorsal yellow (?) lines; caudal horn yellow on the sides.

Pupation. The larva enters the earth to transform. In the Southern States the first brood enters the pupa state about the middle of June, and becomes imago early in July; pupation begins with the second during the latter part of October, and they appear as perfect insects during the following spring. The pupa is smooth, abdomen cylindrico-conical and acute; color deep brown. (*Abbot & Smith.*)

Food-plants. The leaves of the wild cherry.

CLEMENS.

†† *Fore wings denticulated on hind margin, with a denticulation opposite disco-central nearly obsolete.*

2. **S. excæcatus** *Abbot & Smith.* Figured in Sm. Abb. I, pl. 25.

Palpi, head and thorax fawn-color, with a roseate tinge, with a chestnut-colored thoracic dorsal stripe tapering to the head and metathoracic transverse patch of the same hue. Abdomen fawn-color with a dark brown dorsal line. Anterior wings fawn-color, with dark brown shades, with a small blackish spot at the middle of base and two brown lines crossing the basal portion of the disk; a large, median, brown patch, with its anterior margin darkest and inclined towards the inner angle, and the posterior margin concave in the middle, tinged with purplish towards the centre, containing

a brown discal dot, and joined at an acute angle by a patch of the same hue about the middle of the submedian nervure; two or three brown lines crossing the middle of the nervules and following the outline of median patch, succeeded by an irregular brownish band; the marginal space brown; a small brown spot at inner angle, with two or three black spots above it in sub-median sulcus, with faint blackish streaks in the post-apical, subcostal and costo-inferior and medio-superior interspaces. Posterior wings rose-color in the middle, with a brownish patch at the tip crossed by two or three short whitish lines; ocellus black, pupil pale blue, with two short whitish lines between the ocellus and the inner margin.

Var. A male. Brownish olivaceous. Thoracic streak dark brown. The median shade of the fore wings brownish olivaceous with a purplish tinge, and a deep brown streak at the base of posterior interspace; discal spot blackish.

Egg. Spheroids much flattened above and beneath, almost like narrow sections of a cylinder; smooth, white, with an equatorial, reddish brown band, having a slender, central, white line. Investing tunics thick and resisting.

Young Larva, on first emerging from the egg is green, without granulations, and oblique, lateral stripes; a long reddish caudal horn; without thoracic subdorsal lines.

Mature Larva. I regret I have no description of the mature larva. The following is that of Harris: Apple green, with two short, pale lines before, seven oblique, yellowish white lines on each side and a bluish caudal horn. According to Abbot & Smith's figure, the head is green with a crimson line on each side; the body yellowish green, lateral bands and caudal horn yellow, with a subdorsal and dorsal stigmatal row of crimson spots.

Pupation. The larva enters the ground to transform; the pupa is chestnut-brown, smooth, with a short, obtuse, terminal spine.

Food-plants. The leaves of the apple tree and those of the *Rosa carolina.*

Pennsylvania; Massachusetts; Georgia.

CLEMENS.

§§ *Costa of superior wings rounded and entire from the base to the tip, which is rounded.*

† *Fore wings denticulated on hind margin, with that opposite disco-central nearly obsolete.*

3. **S. modesta** *Harris.* Figured in Agas. Lake Sup. pl. 7.

Palpi, head, thorax and abdomen olivaceous. Anterior wings from the base to nearly the hind end of the disk very pale olivaceous, with an indistinct, irregular, darker streak across the middle, and margined towards the base of the wing with a still paler hue; a broad, deep, olivaceous, median band, undulating anteriorly and crenated or undulating posteriorly, containing a pale, angular, discal spot and darkest towards the base of the wing; a deep, olivaceous band across the middle of the nervules crenated posteriorly and bordered with a paler hue; the remainder of the wing is deep olivaceous with a paler band from the middle to the inner angle. posterior wings purplish-red in the middle, with a transverse, black spot above inner angle and a blackish, olivaceous patch beneath it; in the male the wing is olivaceous exteriorly and along terminal border.

Pupation. Mr. Ashton, of N. Y., has taken the perfect insect in July.

Food-plants. Mr. Crist, of Nazareth, Northampton Co., Pa., informed me he found a larva of this insect several years ago on the Lombardy poplar.

Massachusetts; Lake Superior; Pennsylvania; Sonora, Mex., New York.

CLEMENS.

†† *The hind margin of fore wings angulated and excavated. Articles of the antennæ with single short pectinations in* ♂, *simple in the* ♀.

4. **S. geminatus** *Say. Sphinx ocellatus jamaicensis* Drury. *Smerinthus cerisii* Kirby. Figured in Drury II, pl. 25. Kirby Faun. pl. 4. Say's Amer. Ent. 1, pl. 12.

Palpi reddish-brown; head thorax in front and tegulæ whitish or pale gray, with a large, thoracic, dorsal, deep chestnut, semi-oval patch. Abdomen brownish-gray. Anterior wings gray, tinged with rosy and with dark brown streaks and patches; two curved, brownish, basal lines bordered with rosy-gray; the basal half of medio-posterior interspace filled by a dark brown or a ferruginous brown patch, joined by a line of the same hue crossing the disk from the costa and obliquely by another from the upper third of inner margin, shaded posteriorly with brownish, through the centre of which passes the sub-median nervule; discal spot

pale, margined with brown; a brownish band, margined before with darker brown, crosses the base of the nervules, and is followed by two or three more or less distinct rosy-gray and brownish, undulating, subterminal lines; a deep brown, semi-oval patch at the tip edged with whitish, and a ferruginous brown spot above inner angle, usually with two smaller spots above it; the middle of terminal space dark brown. Posterior wings rosy, along exterior and terminal border yellowish-gray; ocellus black, emitting a short, broad line to inner angle, and with two or three blue pupils.

Food-plants. I have secured numbers of the pupa from the middle of October to the beginning of November at the base of willows.

Canada; Illinois; Massachusetts; Pennsylvania; Jamaica.

CLEMENS.

‡‡ *Structure unknown.*

5. S. ophthalmicus *Boisduval.* Ann. Soc. Ent. t. III, 3me ser. xxxii.

Le *S. ophthalmica* assez rapproché de notre *ocellata*, plus voisin de *geminatus* de Say, mais l'oeil n'est pas double et il diffère de toutes les espéces du même groupe par sa large bande brune, anguleuse, qui traverse le milieu des ailes supérieures.

S. ophthalmicus is nearly related to the European *ocellatus*, and more intimately to *geminatus* of Say, but the pupil is not double, and it differs from all the species of the same group by having a large, angular, brown band traversing the middle of the superior wings.

This description of M. Boisduval is almost too indefinite to authorize even a conjecture respecting this species, but it will possibly prove to be merely a variety of *geminatus*.

CLEMENS.

‡‡‡ *Antennæ ciliferous in the* ♂, *simple in the* ♀.

6. S. astylus *Drury. Sphinx io* Boisd. Figured in Drury II, pl. 26.

Reddish-brown or cinnamon-colored. Thorax with a dorsal ferruginous stripe attenuated before. Tegulæ tinged with rosy white in the ♀. Abdomen fawn-color, with a faint dorsal brownish line and the sides in the ♂, somewhat tawny yellow, in the ♀ rosy white. Anterior wings very white toward the base in the ♀,

with a bluish-black stripe along the inner margin, and a line of the same hue along the medio-posterior nervule, joining it near the inner angle, with sub-terminal whitish bands faintly tinged with roseate, and a tawny yellow spot at the tip and inner angle. Posterior wings tawny yellow or lutescent, intermixed with brownish toward the costa, and a black ocellus above the inner angle, with a bluish pupil. Under surface of anterior wings tawny yellow, somewhat reddish-brown exteriorly, with yellow spots and white bands corresponding to those on the upper surface. Posterior wings reddish-brown, with two parallel, irregular rosy white central lines. Length of the body 45 lines; expanse of the wings 30 lines in the ♂, 33 lines in the ♀.

Massachusetts; New York.

CLEMENS.

GROUP II.

The hind margin of the anterior wings somewhat excavated from the tip to medio-central nervule, and thence rounded to the inner angle, entire in the ♂, crenated in the ♀. Posterior wings emarginate at the tip, hind border entire in the ♂, crenated in the ♀. Antennæ with the stalk ciliferous, and the articles produced beneath the stalk each bearing four short pectinations in the ♂, and simple in the ♀. Palpi short in the ♀ and scarcely exceeding the front; in the ♂ exceeding it, divergent, almost attaining the level of the vertex, the development being in the second article and the third rudimental; the tongue about as long as the palpi.

Larva, is granulated on transverse wrinkles, tapers anteriorly, the thoracic rings being slender. The head is pyramidal and granulated, the vertex elevated above the dorsum and bifid; caudal horn densely spined. The pupa is rough, with the terminal segments of abdomen flattened.

The position of the larva at rest is not sphinx-like; it is extended along the mid-rib of a leaf, and when disturbed, throws its head from side to side, making a crepitating noise.

This group has its European representative in *Smerinthus populi*.

7. S. juglandis *Abbot & Smith.* Figured in Sm. Abb. I, pl. 29.

Palpi reddish brown or dark brown; head and thorax pale fawn color or pale grayish, with a more or less distinct thoracic dorsal, brownish stripe. Abdomen fawn color or unicolor. Anterior wings, from the base to about the middle of disk, pale gray, with a faint lilac tinge or pale fawn color, and a brownish line crossing the basal part of the disk; a broad median shade, with its posterior margin commencing on the costa midway between the origin of post-apical vein and the tip, and inclined to about the middle of inner margin, darkest at the edges and ochraceous brown, dark brownish or ferruginous brown, and sometimes almost obsolete above the medio-posterior vein, whence are emitted two lines which mark the outline of the shade; a line of the same hue parallel to posterior margin of median shade, with an intervening paler space and a light-colored shade near hind margin, extending from disco-central vein to the inner angle; the marginal space dark colored, with a small light-colored costal spot extended to the tip. Posterior wings ochraceous brown or dull fawn color, with a central light-colored band edged on each side by dark lines, corresponding to the posterior edge of median shade and its parallel line.

Mature Larva. Head pale reddish brown, with a pale yellow lateral stripe and granulations. Body pale green or yellowish green, with oblique lateral crimson streaks, edged beneath with pale yellow; body tinged with crimson above the prolegs and behind the horn; granulations pale yellow; horn brownish, with blackish spinules. Feet dark reddish brown. Length about $2\frac{1}{4}$ inches.

Pupation. The pupa is blackish brown, roughened, with four little prominences on the front of the head-case, and the terminal segments flattened on the ventral surface. The larva attains its full growth about the middle of September, and undergoes its transformation in a cell just beneath the surface.

Food-plants. The leaves of the black walnut and the hickory.

Massachusetts; New York; Pennsylvania; Georgia.

CLEMENS.

DAREMMA WALKER.

Body rather slender. Proboscis short, distinct. Antennæ setaceous, serrated, a little longer than the thorax. Abdomen tapering, full thrice the length of the thorax. Legs rather short and

stout; hind tibiæ with four long spurs. Wings long, moderately broad. Fore wings very slightly convex in front, hardly acuminated, entire, slightly convex and very oblique along the exterior border. Hind wings hardly acuminated.

1. **D. undulosa** *Walker*, p. 231.

Cinereous, hoary beneath. Thorax with a black testaceous-bordered band in front and another behind, where there is also a white band; a black stripe on each side. Abdomen with slight testaceous bands, with a brown stripe in the middle, and with brown spots along each side. Wings with white brown spotted ciliæ. Fore wings with slender undulating blackish bands, three toward the base and four beyond the middle, where there is a white blackish-bordered discal spot; a blackish apical streak. Hind wings with three brown bands.

Length of the body 13 lines, of the wings 36 lines.

Orillia, West Canada.

CLEMENS.

ŒNOSANDA WALKER.

Male. Size small. Body moderately stout, subfusiform. Head slightly crested. Proboscis moderately long. Palpi a little longer and more slender than in the other genera; third joint minute, conical, apparent. Antennæ setaceous, very minutely serrate, much longer than the thorax. Abdomen less than twice the length of the thorax, slightly tufted at the tip. Legs rather slender; hind tibiæ with four moderately long spurs. Wings rather short, moderately broad. Fore wings rounded at the tips, moderately oblique and slightly convex along the exterior border; first, second, and third inferior veins somewhat approximate; fourth remote.

1. **Œ. noctuiformis** *Walker*, p. 232.

Hoary, whitish beneath. Head with a brownish crest. Thorax with a brownish stripe along each side. Abdomen with a black dot on each segment. Fore wings with several slender undulating or angular, dark brown bands, and with a transverse more distinct

streak by the interior angle, near which there is a brown spot. Hind wings brown, yellow towards the base.

Length of the body 6 lines, of the wings 14 lines.

St. Domingo.

CLEMENS.

LAPARA WALKER.

Male. Body rather slender. Head small, short. Proboscis moderately long. Palpi very short. Antennæ slender, subclavate, hardly longer than the thorax and attenuated but hardly hooked toward the tips. Abdomen linear, full twice the length of the thorax. Legs slender; hind tibiæ with four moderately long spurs. Wings rather narrow, not long. Fore wings almost straight in front, slightly rounded at the tips, straight and very oblique along the exterior border; interior border straight; second inferior vein far nearer to the first than to the third; fourth very remote. Hind wings rounded at the tips.

This genus has much outward resemblance to the *Bombycidæ*.

1. L. bombycoides *Walker*, p. 233.

Cinereous. Fore wings with a zigzag, oblique, black line, and with several lanceolate, black marks. Hind wings brownish, paler towards the base; ciliæ white.

Length of the body 10 lines; of the wings 24 lines.

Canada.

CLEMENS.

ELLEMA CLEMENS.

Size small. Body rather slender, diameter nearly equal, but slightly fusiform in the ♂. The head is quite small, sessile and somewhat depressed, being but partially visible from above; the front moderate, vertical and subtufted; the palpi rather short and slender, but equal to the front; the tongue equal to palpi; the eyes very small; the antennæ terminating in a short hook and seta, and longer than the thorax. The thorax is very short and pilose, but little advanced anterior to the base of the fore wings and rather globosely rounded in front. The abdomen is cylindrical,

or nearly so, and about thrice the length of the thorax. The anterior wings are equal to the length of the entire body, and are a little more than twice longer than broad, with the tip rounded, and the hind margin entire and obliquely convex, the inner angle rounded and the inner margin straight. Hind wings rounded at the tips.

Male. Antennæ prismatic and ciliferous. *Female.* Antennæ fusiform and finely ciliated.

1. **E. harrisi.** *Sphinx coniferarum* Harris, p. 297.

The palpi, head and thorax moderately pale umber, with the sides of the thorax at the base of the anterior wings and lower portion of tegulæ grayish. Abdomen brownish-gray. Anterior wings umber colored, varied with pale gray, with two blackish-brown lines from the inner margin crossing the disk to the costa, and a series of blackish lunules in the interspaces, extending from the costa a little beyond the origin of post-apical nervule to the lower third of the inner margin and bordered interiorly with pale gray; the mark in medio-central interspace is lanceolate, and sometimes that in the posterior interspace; the ends of the nervules tipped with dark brownish; fringes brown, spotted with white. Lighter towards the base. *Female,* the pale gray less abundant on anterior wing, with long black dashes in the basal portion of medio-central and posterior interspaces, and blackish in the middle of submedian sulcus.

Mature Larva. Mr. George Newman, a collector in Philadelphia, assures me he has taken the larva of this insect near maturity on the pines of New Jersey about the latter part of September. He could describe it only in general terms. It was without a caudal horn, and in general color green.

Maine; New Jersey; New Hampshire; North Carolina.

CLEMENS.

ARCTONOTUS Boisd.

Male. Body thick, very pilose. Proboscis very short, obsolete. Palpi stout, very short and pilose. Antennæ thick, serrate, very pubescent, much longer than the thorax. Abdomen elongato-obconical, hardly longer than the thorax. Legs stout, pilose;

hind tibiæ with four rather short spurs. Wings moderately broad, not long, hardly denticulated, rather deeply ciliated. Fore wings straight in front, slightly acuminated, rather oblique and slightly convex along the exterior border; second inferior vein (medio-superior) nearer to the third (medio-central) than to the first (disco-central); third rather further from the fourth (posterior) than from the first. Hind wings much rounded at the tips.—*Walker.*

This genus appears to connect *Smerinthus* with the *Bombycidæ.*

1. A. lucidus *Boisd.* Walker, p. 264.

Male. Gilded, tawny. Palpi brown. Antennæ testaceous with ferruginous branches. Lappets of the thorax (*tegulæ*) with a darker border, which has a whitish edge. Fore wings with two oblique, purplish bands, which are connected along the interior border. Hind wings red, with gilded borders, and with a ferruginous submarginal band.

"Size of our *œnotheræ.* Wings quite entire; the superior dim yellowish-gray, with a brilliant yellow reflection, marked with two or three very obscure transverse bands, the most decided of which is sinuous and placed near the extremity. Inferior wings violet, with the extremity of an obscure purple and the fringe paler.

Body very short; corselet very hairy, of the color of the superior wings. Antennæ very robust (*très fortes*). Under surface of the wings of a grayish tint, with the disk of the superior ferruginous." *Boisduval, Ann. Soc. Ent. Fr.,* 2me ser. X, p. 319.

California.

CLEMENS.

FAM. IX. DREPANULIDAE.

Appearance geometriform. Proboscis often none, sometimes conspicuous. Palpi very short. Antennæ of the male usually pectinated, of the female, simple. Abdomen not extending beyond the secondaries. Legs slender; wings wide; primaries *often falcate.* Flight nocturnal; wings extended in repose. Larva naked, with fourteen feet, gibbous on the back, attenuated behind, no anal feet.

The following genus is the only representative of this family as yet discovered in this country.

DREPANA Schr.

Body very slender. Proboscis not visible. Palpi very short, not extending beyond the head. Antennæ longer than the thorax. Abdomen not extending so far as the hind wings. Legs slender, bare, hind tibiæ with four rather short spurs. Wings broad. Primaries falcate, slightly convex along the costa, undulating or indented along the exterior border; interior angle rounded; discal areolet intersected by a secondary vein; second inferior vein more than twice further from the third than from the first; third not further from the fourth than from the second. *Male.* Antennæ moderately pectinated. *Female.* Antennæ very minutely pectinated, much longer than those of the male.

1. D. fasciata *Steph.* *Uncula* Haw.

Wings brownish-yellow; anterior with two oblique brown striæ, bent towards the costa; the posterior one with a brown cloud attached towards the outer margin; between these streaks is a small black dot towards the anterior edge of the wing; posterior wings with a single streak.

Walker.

2. D. arcuata *Walk.* C. B. M. VIII.

Male. Pale testaceous. Antennæ with brown branches. Fore wings very falcate, with brown oblique streaks along the costa; with two slender zigzag brown bands near the base, with two dark-brown discal dots, and with three exterior brown bands; the first and the third of the latter slight and undulating; the second darker, more distinct, and nearly straight, ending at the tip of the wing, which is pale brown in front and gray behind, excepting the extreme tip, which is wholly dark brown. Hind wings with several indistinct tawny undulating bands, and with two minute brown discal dots. Length of the body 4 lines; of the wings 15 lines.

This species closely resembles *D. falcataria* in form and color and markings, but may be distinguished by its more falcate fore wings, by the more oblique second exterior band, by the less numerous and less distinct bands of the hind wings, and by other differences.

Nova Scotia.

Walker.

The two following species differ from the European groups of *Drepana* by the outline of their fore wings, which are convex in the middle of the exterior border.

WALKER.

3. D. rosea *Walk.* C. B. M. VIII.

Male. Pale dull rose-color. Head bright rose-color. Antennæ with rather short and thick-set branches. Hind tibiæ with the apical spurs rather long. Wings partly yellow towards the base, with a yellow oblique and slightly undulating band, which in the hind wings is dilated, and occupies the whole apical half of the wing, with the exception of a spot in front of the exterior border. Fore wings nearly straight along the costa, slightly falcate at the tips; exterior border undulating, convex in the middle, third inferior vein thrice further from the fourth than from the second. Length of the body 4 lines; of the wings 12 lines.

Nova Scotia.

WALKER.

4. D. marginata *Walk.* C. B. M. VIII.

Male? Like *D. rosea* in the form of its wings. Yellow. Head rose-color. Antennæ like those of *D. rosea* in structure. Legs partly red, more pilose than those of *D. rosea;* hind tibiæ with very minute spurs. Wings with some slender indistinct oblique and undulating pale-reddish bands. Fore wings nearly straight in front, slightly falcate at the tips, undulating along the exterior border, which is convex in the middle; costa with a slight reddish tinge towards the base; exterior border with a red band, which contains some black marks, and is continued to the fore part of the exterior border of the hind wings; two white discal dots; second inferior vein about twice further from the third than from the first; third twice further from the fourth than from the second. Length of the body 4 lines; of the wings 12 lines.

WALKER.

FAM. X. SATURNIDAE.

Antennæ bipectinated in the male; much longer than the width of the head. Tongue often obsolete. Palpi very short. Legs robust, hairy; hind tibiæ with two small apical spurs. Abdomen pilose, sometimes not reaching the ends of the

wings. Wings wide and sometimes fenestrate; fore wings often falcate, interior margin with only one vein. No *frenulum*.

SATURNIA Schrank.

Palpi distinct, rather short, clothed with scales, compressed, triarticulate, terminal joint short, ovate; maxillæ obsolete. Antennæ short; those *of the male* bipectinated, each joint bearing a simple pectination, the latter diminishing in length towards the apex of the antennæ; those of the female with each joint unidentate, *not pectinated;* head moderate; thorax rather short and pilose; abdomen moderate, pilose, tufted at the apex; wings entire, broad, horizontally expanded.—*Stevens' Illust. Brit. Ins.*, Vol. II, p. 36.

1. **S. io** *Smith & Abbot.* Figured in Vol. I, pl. 49. Naturalists' Lib. XXXVII, p. 156, pl. 16, fig. 3.

Antennæ, head, and thorax yellow, the two latter hairy; superiors, yellow in the male, with several undulating brown streaks; reddish-brown in the female, with three waved continuous yellow lines across the surface and a cluster of small yellow spots towards the centre. Superiors, yellow beneath, with a black ocelliform spot in the middle, with a white pupil, behind which is a transverse reddish ray. Inferiors, yellow above, with a large central ocelliform spot, which is black, with a white elongated pupil; behind this eye there is a black semicircular band, succeeded by another parallel one which is ferruginous; the inner margin of the wing is likewise ferruginous. On the under side yellow, with a transverse ferruginous ray.

The male expands two and a half inches; the female is larger. Thorax and legs ferruginous, abdomen ochre-yellow, with a narrow purple line on each segment.

Larva, clear green, with a lateral brown stripe, edged below with white, beginning on the fourth segment and ending at the anus. Each segment has five or six tufts of green prickles, terminated by minute black points, which occasion a smarting sensation if they penetrate the hand. There is a triangular brown spot on the under side of each segment, beginning with the fourth. Feet brown.

The cocoon is spun between several dry leaves.

It feeds on sassafras (*Laurus sassafras*), dogwood (*Cornus florida*), and poplar (*Liriodendron*).

United States.

2. S. maia *Drury.* Figured in Sm. Abb. pl. 50. *Proserpina* Fab. Nat. Library XXXVII, p. 154, pl. 16, fig. 1. Drury II, pl. 42. Cram. Pap. Exot. II, 3 pl. 98. Pal. Beauv. Ins. Afr. et Amer. pl. 24.

Head and antennæ black; the latter strongly pectinated. Thorax in front whitish. Top of head black and hairy, behind ferruginous. Abdomen above black, terminated by a tuft of ferruginous hairs in the males; below gray, with white spots on the sides. Wings black, thin and translucent; they are crossed by a whitish band, which expands on the inferiors. On each there is a black spot, with a whitish streak on it. Under side similar. Legs black; femurs ferruginous. Expands two and a half inches.

The larva varies much in color, according to age. When full grown, it is yellow, with a broad dark stripe on each side and two reddish tubercles on the top of each segment. The head, posterior segment, and legs, purplish red. Each segment has several hairy spines.

Feeds on various species of oak.

United States.

3. S. hera *Harris,* Ins. of New England, p. 286. Fig. on pl. 359, IV of Audubon's Birds of America.

Resembles *S. maia* in form and size, but the wings are more opaque. Color pale yellow. On each of the wings there is a reniform black spot between two transversely undulating black bands; outer margin black; the veins, from the external black band to the edge are marked with broad black lines, and there is a short black line at the base of the superiors. The head, forepart of the thorax, and upper side of the legs are deep ochre yellow. The rings of the abdomen are transversely banded with black at the base and with ochre yellow on their hinder edges. The reniform spots on the superiors have a very slender central yellow crescent, and those on the inferiors touch the external black band.

Expands three inches.

The other moth figured on the same plate in Audubon is probably the female of *hera.*

Southern States.

HARRIS.

4. **S. eglanterina** *Boisd.* Ann. Soc. Ent. 2me ser. X, 323.

Size and form of *Proserpina*. Upper side of primaries yellowish-white, slightly flesh color, powdered with a little blackish at the base, with the upper edge and two transverse bands black; the one, near the base, uniting with a large longitudinal streak of the same color; the other, near the extremity, bent, but not sinuous. Between these two bands there is a black rounded spot, or kind of eye, marked with a small whitish crescent; fringe widely black, uniting with some sagittate streaks of the same color, situated on the nerves. Secondaries of a beautiful ochry yellow, marked in the middle with a large black point, in place of an eye; beyond the middle a black curved band, in a line with that of the primaries. Fringe black, forming some sagittate spots of the same color. Head and prothorax ferruginous; thorax mingled with yellow. Abdomen of the same color as the secondaries, paler below and a little annulated with black. Under side like the upper. Antennæ black, pennated in the male, a little ciliate in the female.

California.

BOISD.

5. **S. pica** *Walker.* C. B. M. 1318.

Male. White. Head, thorax in front and behind, pectus and femora luteous. Antennæ, tibiæ and tarsi brown. Abdomen above luteous, with a whitish spot and a brown band on each segment. Wings with black borders, with two curved black bands, with a large curved discal black spot, and with marginal black streaks. Fore wings with a black basal streak. Length of the body 11 lines; of the wings 30 lines.

United States.

WALKER.

6. **? megaera** *Fab.* Ent. Syst. III, 1. Walker, C. B. M. pt. v, 1378.

Primaries bluish spotted with white; secondaries white at the apex, blue with yellow waves.

North America.

WALKER.

7. **S. galbina** *Clemens.* Proc. A. N. S. for 1860, p. 156.

Antennæ luteous. Body and head rather dark brown. Fore wings yellowish-brown, with a rather faint, whitish, angulated band at the base. On the discal nervure is a round, black ocellus having

a central subvitreous streak, containing a yellow circle, and toward the base of the wing a slender blue crescent. A whitish band crosses the middle of the nervules, with a faint wavy one between it and the hind margin. In the apical interspace is a black spot, with a crimson streak to the tip of the wing. The marginal portion of the wing is whitish and is tinged in the terminal edge with pale yellowish-brown. Hind wings similar in color and ornamentation to the fore wings, the ocelli being somewhat smaller. On the *under surface*, which is similar in hue to the upper, the faint wavy bands of the fore and hind wings are very distinct.

Texas.

CLEMENS.

ATTACUS LINN.

The *Attaci* are distinguished from the *Saturnians* by their superior size—the wide, strongly pectinated antennæ *in both sexes;* the horizontal and widely extended wings, which are marked with *vitreous, diaphanous spots,* and by the tubercles on the backs of the larvæ.

1. **A. cecropia** *Linn.* Drury, I, pl. 18. Figured in Sm. Abb. pl. 45. Nat. Lib. XXXVII, p. 132, pl. xi.

Antennæ brown and broadly pectinated. Body fulvous. Thorax very hairy, with a white band before. Abdomen annulated with alternate white and dark brown, the latter edged behind with black; primaries falcate at their extremity. They are brown and covered with a white dust; a fulvous spot at the base, bordered with whitish. On the disk, a semi-transparent reniform spot, bordered with black, with a white centre. A fulvous band crowned with white crosses both wings; a sinuous whitish band on a grayish ground crosses the posterior edge; towards the inferior angle there are two or three irregular round black spots in a series; near the upper angle there is an ocellated black spot, nearly surrounded with green; between this and another oblong black spot on the tip, there is a mark similar to an inverted W.

Secondaries similar, excepting the lower edge, which has a narrow brown band; above it a series of spots of the same color, on a grayish ground, which is surmounted with a broad band of brown. The discoidal spot is larger and the transverse band broader.

Expands from five and a half to six inches.

Larva, light green; the second segment, surmounted with two red tubercles, having a number of short black hairs; the third segment has two larger tubercles; the others are crowned with oval yellow warts with hairs at the end; the last segment has but one of a larger size. On the side, two series of long, light blue tubercles, and a shorter series over the first five segments.

Feeds on apple, cherry, wild plum, currant, barberry.

It spins an oval cocoon, which is often as large as a hen's egg, which it attaches to the side of a stem. Externally it is brown and wrinkled; inside of this outer covering there is paler brown silk; this covers an inner cocoon closely spun, within which the chrysalis reposes.

United States.

2. **A. promethea** *Drury*. Figured in Drury II, pl. 11. Sm. Abb. I, pl. 46. Nat. Lib. XXXVII, p. 134, pl. 12.

Eyes and antennæ dark brown; the latter broadly pectinated in the males. Thorax and abdomen dark brown. Legs and under side of the body reddish-brown. Wings same color, falcate on the outer edge. A sinuous, grayish line crosses both in the middle; outer margin drab, through which passes a sinuous, dark reddish line; an ocellate black spot, surmounted by a blue crescent near the tip, between which and the tip there is a zigzag whitish line. The wings near the upper angle are of a rich flesh color.

The secondaries are similar, except the drab margin, on which, besides the sinuous line, there is a series of oblong dark brown spots between the line and ground color of the wings.

The under side is similarly marked, but the color approaches to a crimson tint. In the middle of the superiors there is a small sagittate spot of dark red; the inferiors have an indistinct, short, white line in the middle. Expands three inches and a half.

The female differs considerably from the male. The body is reddish-brown. The upper surface of the wings is bright ferruginous. They have the ocellated spot and the zigzag line near the tip as well as the sinuous line on the drab margin as in the male, but the oblong corresponding spots on the inferiors are ferruginous instead of brown.

Both lower wings are crossed by an undulating yellowish-white line, the inner edge of which is black and the outer gray. At the

base there is a large fulvous spot, bordered with white and black. On the middle of the superiors there is an oblong yellowish-white spot, broadest at the upper extremity, bordered with black. On the middle of the inferiors there is a spot of similar color, but more square and emarginate below.

The under surface is similar, but the color is brighter and the ocellated spot on the superiors is brownish. Expands four inches.

Larva green; feet yellow. Each segment except the posterior has six blue spots, mounted with black tubercles. In the second and third segments the two middle tubercles are supplanted by two red processes of a third of an inch in length. The last segment has but five tubercles; the central one has a yellow process.

It feeds on *Laurus sassafras*, spice wood, *L. benzoin*, and swamp buttonwood, *Cephalanthus occidentalis*.

In preparing for its transformation, it selects a leaf and covers the upper surface of it with a yellowish-brown silk, extending this coating over the footstalk of the leaf and attaching it firmly to the branch. It next draws the edges of the leaf together, thus covering itself with a mantle, in which it spins a strong cocoon. It soon assumes the pupa form, in which state it remains suspended with the leaf during the winter and is disclosed the next summer.

United States.

3. **A. luna** *Fabr.* Figured in Sm. Abb. pl. 48. Drury, I, pl. 4. Cram. Clerck, Icon.

Antennæ brown; head white and small. Thorax white, sometimes yellowish or greenish, with a reddish-brown band at the anterior part, which extends the whole length of the upper edge of the superior wings.

Body of the same color with the thorax, but usually whitish. Both pairs of wings are clear green. On each there is an ocellate spot, of which a small part is transparent, encircled with yellow, before which there is a semicircle of black and blue, and in that of the primaries a purple line between the semicircle and the transparent part. On one side of each there is also a whitish line. The nervures on all the wings are very distinct and pale brown. The wings near the body are densely pilose.

The secondaries are terminated by a spatular tail, nearly two inches long; all the wings are edged with pale yellow or ochre.

The under side is similar to the upper, except an indistinct un-

dulating line running along the margin of both wings. Feet ferruginous or purple-brown. Body covered with white hairs having the appearance of wool. Expands about five inches.

Larva pale bluish-green. A yellow stripe on each side of the body. Between each segment of the back a line of yellow. On each segment five or six small pearly protuberances, tinged with purple or red, having a few hairs. At the posterior end three brown spots, edged above with yellow. Length, when at rest, about two inches; about three, when in motion.

It spins its cocoon of whitish silk about two inches long, between two or three leaves it has previously drawn together with silken threads. The moth is disclosed in June.

It feeds on walnut (*Juglans*) and hickory (*Carya*).

United States.

4. **A. polyphemus** *Fab.* Figured in Nat. Lib. XXXVI.

Antennæ ferruginous; body of the same color; head cinereous. Superiors falcate, especially in the male. Upper margin cinereous, or dull ochre yellow. Base and outer edge russety. About half from the centre to the tip they are sprinkled with dark brown. Towards the base an irregular band of pale white and carmine. An obsolete ferruginous band crosses the middle. Towards the margin a band of pale purple and brownish, terminated at the tip with a black spot interrupted by the nervure, on a whitish ground nearly surrounded with purple. Near the centre there is an ocellate, transparent spot, bordered with a double ring of yellow and black, and a whitish semicircle towards the base.

Inferiors, fulvo-cinereous; posterior border russety; a broad band, half pale violet and half blackish, surmounts this border. In the centre, a large black ocellate spot, with a yellow iris and a transparent oval point in the middle. Above the transparent part there is a blue dust that insensibly mingles with the black.

On the under side the ground color is paler, but the bands are more distinct. The outer border of the superiors is deep brown. The base of the inferiors is brighter ferruginous, resting on a brown band crossing both inferiors horizontally. The black part of the ocellate spot on the upper side is not discernible, and instead of the band there is a row of indistinct semicircular spots. Expands nearly six inches.

Larva, somewhat similar to that of *A. luna*, but it is destitute

of the lateral yellow stripe and the bands between the segments. It has pearly tubercles tinted with purple. Head and feet brown. Posterior end bordered by a brown mark similar to the letter V.

It forms its cocoon similar to *A. luna*.

United States.

5. **A. paphia** *Fab.* Figured in Petiv. Gazoph. tab. 29.

Nearly the size of *A. cecropia*. Primaries with the extremity subfalcate; ferruginous yellow, with the anterior edge cinereous. A yellowish white band, an ocellated spot, white, of which the middle is gray. The iris brown and the pupil transparent; edge ferruginous, on which there is a black violet ray. A little before the extremity there is an indistinct blackish marginal spot. Secondaries yellow, rounded, an ocellated spot similar to the preceding placed in the middle; paler towards the posterior edge, with indistinct undulated rays. Under side ferruginous yellow, with the same spots as on the upper side. The ocellated spots of the male are oblong; those of the female round.

North America.

Godt.

6. **A. angulifera** *Walker*. C. B. M. 1224.

Male and female. Wings with a blackish zigzag band, which extends from much beyond the middle of the costa of the fore wings to three-fourths of the breadth of the interior border of the hind wings. This band is diffuse on the inner side, and is bordered with a diffuse whitish line on the outer side. Discal spot whitish, forked, with a black border; larger in the fore wings than in the hind wings. Exterior border pale testaceous, curved, outwardly black bordered band between the base and the discal spot, and with a black subapical ocellus, which is bordered with white on the inner side. Hind wings with a row of elongated spots near the exterior border.

Male. Brown. Antennæ very deeply pectinated; branches in pairs, which are of equal length. Abdomen extending to much less than half the breadth of the hind wings.

Female. Ferruginous or reddish. Antennæ moderately pectinated; the alternate branches black and rather longer than the others. Abdomen extending to much more than half the breadth

of the hind wings. Length of the body 7—12 lines; of the wings 42—48 lines.

North America.

WALKER.

7. **A. didyma** *Palis de Beauv.* Figured in Palis of de Beauv. pl. 20.

Body very thick, very hairy; wings saffron yellow. Primaries with some vinous spots; sprinkled above with numerous, small, irregular dots; a large vinous spot at the base; external edge with a deeper band, nearly ferruginous, bordered with the same color as the base. Each wing has two round, ocelliform spots towards the middle; ring vinous; centre white; these two are contiguous on the primaries. Those on the secondaries are a little separated, the upper one is browner. Under side paler yellow, edges above a little ferruginous and somewhat more spotted than the rest. The ocelliform spots have their edges nearly violet; upper spots entirely violet.

North America.

DE BEAUVOIS.

8. **A. splendida** *De Beauvois.* Ins. en Afrique et en Amer. p. 133, pl. 22, f. 1, 2.

Dull reddish-brown. Thorax banded with white before and behind. Abdomen with a white stigmatal band, edged above and beneath with black, and containing reddish-brown spots. Fore wings with a basal white streak extending from the costa to the base of medio-posterior nervule and thence to the inner margin at the base of the wing, bordered toward the base with orange-yellowish and externally by black. The breadth of the disk is occupied by a large trigonate vitreous patch, extended behind so as to interrupt a white, wavy, narrow band crossing the middle of the nervules, and which is bordered internally with black and externally with orange-yellowish. The trigonate patch is edged within by white and externally by black behind and before. Beyond the transnervular band the wing is brown dusted with blackish and powdered with whitish roseate in the medio-posterior and submedian interspaces behind the band. At the tip is a large whitish roseate patch, three contiguous black spots at the end of the postapical interspace, with a wavy, black, submarginal line. Hind margin luteo-testaceous. Hind wings, trigonate vitreous patch somewhat larger than in fore wings, continued around the costa to the base of the wing and the

medio-posterior interspace and those adjoining it, powdered with whitish roseate behind the band. Hind margin luteo-testaceous, with a row of black spots and a dark brown line.

Texas.

CLEMENS. Proc. A. N. S. for 1860, p. 160.

CERATOCAMPA HARRIS.

Body thick. Proboscis short, hardly visible. Palpi very short, not exceeding as far as the head. Antennæ a little shorter than the thorax. Legs stout, rather long, hind tibiæ with two very minute apical spurs. Wings rather long, moderately broad. Fore wings acuminated, very slightly convex in front; exterior border almost straight, very oblique; second inferior vein twice or more than four times further from the third than from the first. *Male.* Antennæ deeply pectinated, merely serrated for more than one-third of the length from the tips. *Female.* Antennæ simple.

(The name of the genus is founded on the character of the larva, that being armed with horns.)

C. B. M.

1. **C. regalis** *Fab.* *F. regia* Sm. Abb. *Laocoon* Cram. Figured in Sm. Abb. p. 121, pl. 61. Nat. Lib. XXXVII, p. 161, pl. 18. L. Drury, pl. 9.

Antennæ pectinated half their length, and setaceous at the end; head orange-red; thorax same color, with a yellow band in front, extending round each side, and two longitudinal broad yellow lines on the top; abdomen red, with a yellow band across each segment except the last. Superiors olive, with about six large yellow spots in a series crossing them, the two largest near the tip; two or three other irregular yellow spots further towards the base; two yellow spots at the base; nervures thick and red. Inferiors orange-red, with large irregular patches of yellow and a series of six or seven olive-colored sagittate spots between the veins towards the anal angle. The under side of the superiors is yellow at the base, red in the centre, and olive on the margin. The series of yellow spots and the red nervures similar to the upper side. Under side of inferiors bright yellow, with a red spot in the centre. A pale red transverse band which expands and covers the whole of the outer

angle, where there are a few sagittate olive spots. Body beneath yellow, with some red spots; legs red. Expands five inches.

Larva green, with pale blue across each segment; on the side of each segment a large bluish spot nearly square; head and feet orange. On the first segment two long curved spines; on the second, four, and an equal number on the third. They are yellow, except at the tip, and are beset with small sharp points. On each of the other segments there are six shorter spines, except the eleventh, on which there are seven, the longest one in the middle, and on the last segment there are eleven. Length from five to six inches.

Feeds on black walnut (*Juglans*), persimmon (*Diospyros virginiana*).

Chrysalis short and thick, with a small mucro at the posterior part and edges of the segments without spines.

United States.

2. **C. imperialis** *Drury*. *Imperatoria* Sm. Abb. Figured in Sm. Abb. II, pl. 55. Jardine's Nat. Lib. XXXVII, pl. 17.

Antennæ and head yellow or reddish-brown; thorax brown in front, yellow on top, purple on the sides; abdomen yellow, shaded with purple.

Primaries yellow, sprinkled with purple, a large purple spot at the base, a double round spot, with a yellow centre on the disk, a sinuous purple band, commencing at the tip and crossing the wing, a broad purple patch on the external border.

Secondaries of the same color, a smaller purple cloud at the base, a purple band with a round spot, having a yellow centre resting on it. Under side paler, the sprinkled dots not so numerous, and the bands indistinct. Expands four and a half inches.

Larva varies in color; sometimes tawny, again orange and tawny, occasionally green. It has two short rugose horns on each of the second and third segments, and some minute sharp points on the others, crowned with tufts of long rigid hairs. There is a small yellow spot, surrounded with a black ring, on the sides of all the segments except the first three.

Feeds on the plane-tree (*Platanus occidentalis*), the oak (*Quercus*), sweet gum (*Liquidambar*), and pine (*Pinus*).

Chrysalis narrow, elongated, tail bifid at the extremity, edges of the segments armed with a regular series of spines.

United States.

DRYOCAMPA Harris.

Body stout. Proboscis not visible. Antennæ shorter than the thorax. Abdomen hardly extending beyond the hind wings. Legs stout; hind tibiæ with two minute apical spurs. Wings moderately broad, thinly pilose. Primaries straight along the costa, acuminated at the apex, hardly convex, and very oblique along the exterior border.

Male. Antennæ deeply pectinated to much beyond half the length, minutely serrated from thence to the tips. *Female.* Antennæ simple.

1. D. stigma *F.* Figured in Smith & Abbot, p. 111, pl. 56.

Reddish-ochreous. Superiors purple on the outer border and internal side, thickly sprinkled with blackish dots; a small white spot in the centre and crossed from the tip with a narrow purple band. Body deep yellow; the under side similar though paler and not having so many black spots. Inferiors with a narrow transverse purple red band; border sprinkled with a few black dots. Expands from one inch and three-quarters to two inches and three-quarters.

Larva yellow, with black thorns on the back. Feeds on the oak.

United States.

2. D. senatoria *F.*

Ochre-yellow. Wings faintly tinged with purplish-red, especially on the front and hind margins, and crossed by a narrow purple-brown band behind the middle. Superiors sprinkled with blackish dots; a small white spot near the middle. The male is much smaller than the female; its wings are thinner and more tinged with purple-red. Expands about an inch and three-quarters; the females two and a half or more.

Larva black, with four narrow ochre-yellow stripes along the back and two on each side. On each segment about six short thorns or sharp points, besides two on the top of the second segment, which are long and filiform, but not flexible.

United States.

3. **D. pellucida** *Abb.* *Virginiensis* Drur. Figured in Smith & Abbot, p. 115, pl. 58.

Resembles *D. senatoria*, but is smaller and more delicate.

Body ochre-yellow. Superiors of the male purple-brown, with a large colorless transparent space in the middle, near which is a small round white spot, and towards the hinder margin a narrow oblique very faint dusky stripe. Inferiors purple-brown, nearly transparent in the middle, and margined with pale purple. Under side similar.

Larva rust-yellow; body pea-green, shaded on the back and sides with red; striped with very pale yellowish-green, and armed with black spines.

United States.

HARRIS.

4. **D. rubicunda** *F.* Harris, Ins. of Mass. p. 293.

Superiors rose-colored, crossed by a broad pale yellow band. Inferiors pale yellow. Abdomen and legs rose-colored.

United States.

HARRIS.

5. **D. bicolor** *Harris*, Ins. of Mass. p. 293.

Upper side of the fore wings and under side of the hind wings are brownish-gray, sprinkled with black dots, and with a small round white spot near the middle, and a narrow oblique dusky band behind it on the fore wings; the upper side of the hind wings and the under side of the fore wings, except the front edge and hinder margin of the latter, are crimson-red, and the body is brownish-gray. The male expands two inches and a quarter.

United States.

HARRIS.

BOMBYCIDAE STEPH. *Bombycina* Her.-Sch.

The difficulty of distributing this family into consistent genera has been acknowledged by all who have studied it. Various synopses have been proposed, but none, as yet, have been generally adopted. Most of them have been founded more or less exclusively on the perfect insects, but such cannot stand as the larvæ and transformation become better known.

The *Bombycidæ*, so called from *Bombyx*, the ancient name for silkworm, inclose themselves in cocoons of silk in the larval state, and hence are called *spinners* by the Germans. They are mostly thick-bodied moths, with the antennæ generally pectinated in both sexes. The organs of the mouth are in an undeveloped state, the thorax woolly, and the anterior legs often very hairy. The larvæ for the most part have tubercles mounted with tufts of hair, and live exposed on plants.

GASTROPACHA Ochs.

Body thick. Head prominent. Proboscis obsolete. Palpi stout, porrect, pilose, extending some distance beyond the head; third joint less than half the length of the second, rounded at tip. Antennæ curved, a little shorter than the thorax. Abdomen generally extending more or less beyond the hind wings. Legs stout, very pilose, hind tibiæ with two very minute apical spurs. Wings moderately broad, denticulated along the exterior border. Fore wings nearly straight in front, slightly acuminated at the tips, moderately oblique along the exterior border; first and second inferior veins almost contiguous at the base; third rather remote from the second, more remote from the fourth. *Male.* Antennæ rather deeply pectinated. *Female.* Antennæ moderately pectinated.

1. G. americana. Figured in Smith & Abbot, p. 101, pl. 51.

Color, reddish-brown; margins of anterior and posterior wings notched; notches white; behind the middle of each of the wings is a pale band, edged with zigzag dark-brown lines, and there are also two or three short irregular brown lines running backwards from the front edge of the fore wings, besides a minute pale crescent edged with dark brown, near the middle. In the female, the pale bands and dark lines are sometimes wanting, the wings being almost entirely of a red-brown color.

United States.

Harris.

2. **G. laricis** *Fitch.* (*Planosa* Fitch *laricis.*) Figured in Fitch's Second Report.

Male. Head densely clothed with white hairs in front, blackish ones about the eyes. Palpi minutely concealed by fine long hairs. Antennæ short, abruptly bent near the middle, pectinated to the bend, and then shorter to the end. Thorax clothed with long hairs of dark gray; an oblong crest of glossy scales on the posterior part. Tongue short, not coiled. Abdomen with blackish hairs above, whitish beneath, the end with a dense pure white tuft. Wings semitransparent, thickly covered with brown scales, which are denuded; veins robust and white, with darker irregular bands; unemarginate. Legs densely covered with long white tufts; forward shanks have a tuft of blackish hairs.

Female. Much larger, and differently colored. Wings thin, translucent; hind edge with a slender white band; before this there is a narrow pale dusky band abruptly widened near its middle to double its width; this band is margined on its anterior side by a white line, by which it is separated from a much broader and more dusky band which is waved in its middle; forward of this the wings are milk-white, crossed by four very faint equidistant wavy bands of the same delicate pale dusky hue with those behind. Hind wings of the same dusky tint as the bands of the fore wings, but paler; a white line on their hind margin. Body white, with a tuft of pale brown at the apex. Thorax crested blackish. Antennæ shorter than those of the male. Expands an inch and a half.

New York.

Fitch.

3. **G. velleda** *Stoll.* Figured in Smith & Abbot, p. 103, pl. 51.

Body thick and woolly, white, variegated or clouded with blue-gray. On the fore wings are two broad dark-gray bands intervening between three narrow wavy white bands, the latter being marked with an irregular gray line; the veins are white, prominent, and very distinct; the hind wings are gray, with a white hind border on which are two interrupted gray lines, and across the middle there is a broad faint whitish band; on the top of the thorax is an oblong blackish spot, widening behind, and consisting

of long black and pearl-colored scales shaped somewhat like the handle of a spoon. Great disparity in the size of the sexes.

HARRIS.

4. **G. occidentalis** *Walk.* *Ilicifolia* Sm. Abb. *Americana* Harris. Figured in Smith & Abbot, II, pl. 51.

Ferruginous; ciliæ of the wings marked with white; primaries with oblique blackish fasciæ, testaceous at the base, cinereous at the exterior margin; secondaries with the disk partly testaceous.

North America.

HARRIS.

CLISIOCAMPA CURTIS.

Body stout or thick. Palpi short, hardly extending beyond the head; third joint slightly acuminated. Antennæ a little longer than the thorax. Legs stout, pilose; hind tibiæ with two very minute apical spurs. Wings more or less broad. Fore wings straight in front, slightly rounded at the tip, somewhat oblique along the exterior border; first and second inferior veins almost contiguous at the base; third twice further from the fourth than from the second. *Male*, antennæ deeply pectinated. Abdomen robust, hardly extending beyond the hind wings. *Female*, antennæ very slightly pectinated. Abdomen thick, extending for one-third of its length beyond the hind wings. (*C. B. M.*)

1. **C. decipiens** *Walk.* *Castrensis* Smith & Abbot.

Color rust or reddish-brown, variegated with gray, especially on the middle and base of the fore wings. Anterior wings crossed obliquely by two dingy white parallel lines; margin ciliate and whitish. Hind wings without lines or spots; a portion of the costal margin whitish. Beneath darker. Length of the body 5—6 lines; of the wings 10—12 lines.

United States.

WALKER.

Harris, Ins. of Mass., has called this species *Americana*, but that name is preoccupied by Fab.

2. C.? americana *Fab.*

Male. Antennæ strongly pectinate. Wings whitish; primaries with some fuscous costal streaks.

Fab.

3. C. sylvatica *Harris.* Ins. of Mass. p. 271.

Brownish-yellow or nankin color. The hind wings, except at base, are light rusty brown. On the fore wings are two oblique rust-brown and nearly straight parallel lines. A variety is sometimes found with a broad red-brown band across the fore wings, occupying the whole space, which, in other individuals, intervenes between the oblique lines. The wings expand from one inch and a quarter to one and three quarters.

Larva. Light blue, clear on the back, and greenish at the sides. Head blue, without spots. Two yellow spots and four black dots on the top of the first segment. Along the top of the back a row of eleven oval white spots, beginning on the second segment, and two small elevated black and hairy dots on each segment, except the eleventh, which has only one of larger size. On each side of the back is a reddish stripe bordered by slender black lines; and lower down on each side is another stripe of yellow color between two black lines. The under side of the body is blue-black. Lives in communities of three or four hundred under a common web or tent, which is sometimes made against the trunk of the walnut, oak, and more rarely of apple-trees.

Northern States.

Harris.

ARTACE Walker.

Body moderately stout. Proboscis obsolete. Palpi stout, porrect, pilose, not extending beyond the head; first joint short; third minute, conical. Abdomen extending a little beyond the hind wings. Legs stout, pilose; hind tibiæ with two minute apical spurs. Wings rather narrow. Fore wings straight in front, rounded at the tips, very oblique along the exterior border; interior angle somewhat rounded and very obtuse; first and second inferior veins contiguous at the base; third about twice further from the fourth than from the second.

Male. Antennæ rather deeply pectinated to beyond one-third of their length, slightly pectinated from thence to the tips. *Female.* Antennæ moderately pectinated.

1. A. punctistriga *Walker*, C. B. M. pl. 5, 1491.

White. Antennæ with tawny branches. Tarsi with black bands. Fore legs very thickly clothed with long hairs. Fore wings with four oblique bands of black dots on the veins; these bands form each an angle near the costa, and there the dots are largest, and the space between them is occasionally blackish; a row of black dots (which are occasionally obsolete) between the veins on the exterior border. Hind wings with a transverse more or less indistinct brownish mark near the interior angle. Length of the body 8—10 lines; of the wings 16—24 lines.

Georgia.

WALKER.

2. A. albicans *Walker*. C. B. M. 1492, pt. v.

White. Palpi rose color, blackish towards the base. Antennæ with brown branches. Legs with black bands; fore tibiæ partly clothed with rosy hairs. Wings with a row of black dots between the veins on the exterior border, near which there is a parallel row of brownish dots. Fore wings with a rosy tinge towards the base of the costa; veins with black dots, which form four or five oblique bands. Length of body 5—6 lines; of the wings 12—16 lines.

Georgia?

WALKER.

3. A. punctivena *Walker*.

Male. Tawny, shining, paler beneath. Middle tarsi black, with testaceous bands. Fore wings with five oblique bands of black dots; the dots on the veins, with the exception of those of the exterior marginal band which lie between the veins. Hind wings with an indistinct interrupted submarginal grayish band. Length of the body 6 lines; of the wings 12 lines.

WALKER.

Fam. XI. NOTODONTIDAE Her.-Sch.

Body usually robust, pilose, abdomen extending beyond the wings, sometimes nearly double the length. Proboscis often none or very short, sometimes rather long. Palpi moderate, rarely very long. Antennæ of the male usually pectinate, rarely simple; of the female, simple, rarely subpectinate. Eyes usually naked. Legs densely pilose or scaly. Primaries not wide. Wings entire, often long.

CERURA Schr. *Herpya* Hübn.

Body stout, pilose. Proboscis very short. Palpi very short. Antennæ pectinated to the tips, longer than the thorax. Abdomen extending beyond the hind wings. Legs stout, pilose; hind tibiæ with two minute apical spurs. Wings rather long. Fore wings almost straight along the costa, rounded at the tips, very oblique along the exterior border; anterior angle much rounded; discal areolet intersected by a secondary forked vein; three inferior veins, second about four times further from the third than from the first.

C. B. M.

1. **C. borealis** *Harris.* *Furcula* Sm. Abb. Figured in Griffith's Règne Animal, Smith & Abbot, p. 141, pl. 71.

Antennæ feathered in both sexes, but narrow and tapering, and bent upwards at the point; the legs, especially the first pair, which are stretched out before the body when at rest, are very hairy; wings thin and almost transparent. Ground color, dirty white; the fore wings are crossed by two broad blackish bands, the outer one of which is transversed and interrupted by an irregular wavy whitish line; the hinder margins of all the wings are dotted with black, and there are several black dots at the base and a single one near the middle of the fore wings; the top of the thorax is blackish, and the collar is edged with black.

United States.

Harris.

NOTODONTA Ochs.

Body stout. Proboscis distinct, very short. Palpi short, porrect, pilose, not extending beyond the head; third joint very minute. Abdomen extending for one-third or one-half of its length beyond the hind wings. Legs stout, femora and tibiæ densely pilose; hind tibiæ with four rather long spurs. Wings somewhat long, rather narrow or moderately broad. Fore wings nearly straight in front, rounded at the tips, very oblique and slightly denticulated along the exterior border; interior angle very oblique; interior border tufted in the middle; discal areolet intersected by a secondary forked vein; three inferior veins, second thrice further from the third than from the first. *Male.* Antennæ moderately pectinated. *Female.* Antennæ simple.

1. N. angulosa *Sm. Abb.* Figured in Smith & Abbot, pl. 83.

Male. Crested; primaries fawn-color, with black flexuous lines and streaks, back porrect; secondaries whitish. *Female.* Primaries fawn-color, with white spots and three luteous bands; secondaries pale testaceous, with a fuscous subapical costal spot.

Georgia.

C. B. M.

2. N. basistriens *Walk.* C. B. M. 1000.

Male. Cinereous, hoary beneath. Head, thorax, and fore wings partly clothed with black hairs. Proboscis testaceous. Antennæ tawny. Thorax with a slender black band between the fore wings. Abdomen slightly testaceous. Fore wing, with a testaceous patch, which occupies the basal third part of the wing, is bordered with black and has a brownish disk; the adjoining part of the wing has a whitish tinge, which is widest in front, and beyond it is a slender undulating oblique brown band, which is obsolete towards the costa; the wings beyond are indistinctly mottled. Hind wings whitish for about two-thirds from the base, with a slight discal undulating grayish band, which corresponds to the band of the fore wings. Length of the body 8 lines; of the wings 19 lines.

New York.

C. B. M.

The following are placed by Walker in Doubleday's genus *Heterocampa*, which differs from *Notodonta* in the deeper pectination of the antennæ of the males, in the dilation of the fore tibiæ, and in the more slender legs.

1. **H. astarte** *Doubleday*, C. B. M. 1023. Figured in the Entomologist, 57, pl. f. 1, 2.

Primaries ash-green, with ferruginous transverse streaks and central crescent; apex with a white lunate spot.

East Florida.

C. B. M.

2. **H. umbrata** *Walk.* C. B. M. 1023.

Ferruginous. Thorax with a black band in front. Fore wings with several indistinct transverse slightly oblique undulating blackish lines. Hind wings hoary, grayish along the border, and with a slight discal curved grayish band. Length of the body 9 lines; of the wings 20 lines.

East Florida.

C. B. M.

3. **H. varia** *Walk.* C. B. M. 1023.

Female. Cinereous. Thorax with blackish marks. Fore wings with some whitish marks along the costa, with a costal subapical short oblique whitish band, and with three discal whitish spots; five irregular undulating black double bands. Hind wings pale gray, with broad brown borders. Length of the border 10 lines; of the wings 24.

New York.

C. B. M.

4. **H. manteo** *Walk.* C. B. M. 1029.

Primaries fuscous-cinereous, with numerous transverse more obscure streaks, a marginal series of black points, a central white line, in which there is a geminate black point.

New York.

C. B. M.

5. **H. biundata** *Walk.* C. B. M. 1025.

Male. Cinereous. Head, thorax, and fore wings slightly tinged with green. Pectus, abdomen beneath, and legs, whitish. Fore wings with some blackish marks at the base, and with a double

undulating blackish band at one-fourth of the length; two slight oblique and undulating brown bands beyond the middle, and towards the exterior border a more oblique and undulating band of blackish spots; under side grayish, whitish about the borders. Hind wings brownish, whitish towards the base and beneath. Length of the body 9 lines; of the wings 20.

New York.

WALKER, C. B. M.

6. H. ipomaeae *Doubleday*, Entomologist, 60.

Primaries fusco-ferruginous, sprinkled with cinereous, an indistinct middle band, a stigma pupilled with ashy-ferruginous, veins towards the apex black.

Florida.

WALKER, C. B. M.

EDEMA WALK.

Body moderately stout. Proboscis short. Palpi slender, pubescent, extending beyond the head; second joint more than twice the length of the first; third lanceolate, nearly half the length of the second. Abdomen extending a little beyond the hind wings. Legs slender; hind tibiæ with four long apical spurs. Wings moderately broad. Fore wings straight along the costa, almost angular at the tips; exterior border oblique and slightly convex; three inferior veins; first and second contiguous at the base; third remote. *Male.* Palpi ascending. Antennæ minutely pectinated to beyond five-sixths of the length, more than half the length of the body. *Female.* Palpi porrect, shorter than those of the male. Antennæ simple, less than half the length of the body.

1. E. unicornis *Sm. Abb.* Figured in Sm. Abb. II, pl. 83.

Anteriors, light brown, variegated with patches of greenish-white and with wavy dark brown lines, two of which inclose a small whitish space near the shoulders; there is a short blackish mark near the middle; the tip and outer hind margin are whitish, tinged with red in the males; and near the outer hind angle there are one small spot and two black dashes; posterior wings of the male are dirty white, with a dusky spot on the inner hind angle; those of the female are sometimes entirely dusky; body brownish—two

narrow black bands across the forepart of the thorax. Wings expand one and a quarter to one and a half inches.

Larva. The top of the fourth ring rises in the form of a long horn, sloping forwards a little; the tail, with the hindmost feet, which are rather longer than the others, is always raised when the larva is at rest, but it generally uses these legs in walking; head large, brown; sides of the second and third ring, green; rest of the body brown, variegated with white on the back—a few short hairs hardly visible.

United States.

HARRIS.

2. **E. concinna** *Sm. Abbott.* Figured in Sm. Abb. pl. 85.

Color, light brown; forewings dark brown along the inner margin are more or less tinged with gray before; a dark brown dot near the middle, a spot of the same color near each angle, a very small triangular whitish spot near the shoulders, and several dark brown longitudinal streaks on the outer hind margin; the hind wings of the male are brownish or dirty white, with a brown spot on the inner hind angle; those of the female are dusky brown; body light brown, with the thorax rather darker. Expands from one to one and three-eighth inch.

Larva. Yellowish brown, paler on the sides, striped with slender black lines; head red; on the top of the fourth ring there is a hump, also red; along the back, several short black prickles; hinder extremity tapering, and is always elevated at an angle with the rest of the body, when not crawling.

United States.

HARRIS.

3. **E. albifrons** *Sm. Abb.* Figured in Sm. Abb. pl. 80.

Male. Hoary. Palpi brown above. Thorax with a tawny band near the fore border. Forewings with various small brown marks, white along the costa for half the length from the tips; the outline of this white part is very irregular, and the adjoining part of the wing behind it is dark brown; a row of short undulating blackish streaks along the exterior border. Length of the body six lines, of the wings fifteen lines.

Female. Cinereous. Fore wings thinly covered with black flecks; a brown zigzag band at a little before one-third of the length, and extending from the costa to rather beyond half the breadth of the wing; a large white patch on the fore half of the

breadth of the wing between the first band and a second, which is brown, oblique, complete and slightly undulating; beyond the latter there are two slight whitish oblique bands, the first incomplete, the second marginal and intersected by a blackish band. Hind wings pale brown, partially and very thinly flecked with brown, with a brown discal spot, and with a brown oblique slightly undulating band, which is composed of flecks, and corresponds to the second brown band of the fore wings. Length seven lines—wings twenty lines.

United States.

WALKER, C. B. M.

4. E. producta *Walk.* C. B. M. 1031..

Male and Female. Cinereous. Palpi above blackish-brown. Antennæ brown. Thorax with two brown bands. Legs whitish; fore legs above blackish-brown. Fore wings slightly mottled with brown, and with two irregular black slender bands; the first emitting a branch from its middle towards the base of the wing; the second emitting two branches to the fore part of the exterior border; a white apical spot, a whitish spot at the base and some black streaks along the exterior border. Hind wings brown, with a whitish fringe; under side whitish, with two or three bands of brown dots. Length of the body 5—6 lines; of the wings 11—12 lines.

East Florida.

C. B. M.

ICHTHYURA HÜBN. *Pygaera* OCHS. *Clostera* HOFFMANSEGG.

Body moderately stout. Proboscis very short. Palpi short, porrect, not extending as far as the head; third joint, small, conical. Antennæ less than half the length of the body. Abdomen extending for about one-third of its length beyond the hind wings, tufted at the tip. Legs stout; fore tibiæ very densely pilose; hind tibiæ with small apical spurs. Wings moderately broad. Fore wings straight along the costa, rounded at the tips, slightly oblique along the exterior border; interior angle much rounded; discal areolet intersected by a secondary vein; three inferior veins, second nearly contiguous to the first, rather remote from the third. *Male.* Antennæ rather deeply pectinated. *Female.* Antennæ minutely pectinated.

1. **I. inclusa** *Hübner.* *I. anastomosis* Sm. Abb. *I. americana* Har.

Antennæ pectinated in both sexes; the thorax has an elevated crest in the middle; tail tufted and turned up at the end in the males; the fore legs thickly covered with hairs to the end, and are stretched out before the body when at rest; color brownish-gray; fore wings faintly tinged with pale lilac, and more or less clouded with rust-red; they have an irregular row of blackish dots near the outer hind margin, and are crossed by three whitish lines, of which the first nearest the shoulders is broken and widely separated in the middle; the second divides into two branches, one of which goes straight across the wing to the inner margin, and the other passes obliquely till it meets the end of the third line, with which it forms an angle or letter V; across the middle of the hind wings there is a narrow brownish band, much more distinct beneath than above; on the top of the thorax there is an oblong chestnut-colored spot, the hairs of which rise upwards behind and form a crest. All the whitish lines on the fore wings are more or less bounded externally with rust-red. It expands from one inch and one quarter to one inch and five-eighths.

WALKER.

2. **I. albosigma** *Fitch.* Fifth Report, p. 64.

Grayish-brown; fore wings crossed by three faint paler streaks, the two first parallel, the hind one with its outer half silvery white and strongly waved in the shape of the letter S; width 1.50.

United States.

FITCH.

3. **I. vau** *Fitch.* Fifth Report, p. 65.

Similar to *inclusa*, but darker colored and smaller, with the bands more slender and distinct, and may be readily distinguished from that species by its having the first band not dislocated but in its middle strongly curved backwards, the apex of the curve usually forming an acute point. The last band also is much more strongly undulated near its outer end, curving backwards almost in a semicircle, and is of a much more vivid white color and broadly bordered on its hind side with bright rust-red. Its hind wings also are destitute of the paler band across their middle width about 1.20.

United States.

FITCH.

EUDRYAS Hübn.

Wing structure similar to that of the Noctuina. In the hind wings the costal and subcostal veins do not run adjacent and parallel to each other, as is usual amongst the genera of the family, but arise from a short, common stalk. In the fore wings the structure is precisely that of the Noctuina, showing the secondary or subcostal cell, and the subdivision of the nervules characteristic of this group.

The head is smooth, rather short, with ocelli. The antennæ setaceous, minutely ciliated. The labial palpi slightly ascending, but little exceeding the clypeus, smooth, rather thick; middle and basal joints nearly equal, the terminal minute and ovoid. Tongue rather slender, and about as long as the anterior coxæ.

Thorax and basal segment of the abdomen tufted. Breast woolly. Abdomen smooth. Legs tufted; fore legs especially, which have a large globose tarsal tuft, one on the tibiæ and one on the coxæ. In repose, the fore legs are held in advance.

1. E. grata *Fab.* Ent. Syst. III, 457.

Fore wings pure white, with a broad stripe along the front edge, extending from the shoulder a little beyond the middle of the edge and a broad band around the outer hind margin, of a deep purple brown color; the band is edged internally with olive green and marked towards the edge with a slender wavy white line; near the middle of the wing and touching the brown stripe, are two brown spots, one of them round and the other kidney-shaped; and on the middle of the inner margin there is a large triangular olive-colored spot; the under side of the same wings is yellow, and near the middle there is a round and kidney-shaped black spot. The hind wings are yellow above and beneath; on the upper side with a broad purple-brown hind border, on which there is a little wavy white line, and on the under side with only a central black dot. Head black. Along the middle of the thorax, a broad stripe of black and pearl-colored glittering scales. Shoulder covers white. Upper side of the abdomen is yellow, with a row of black spots on the top, and another on each side; under side and the large muff-like tufts on the fore legs, are white; other legs, black.

Larva. Blue, transversely banded with deep orange across the middle of each ring; bands dotted with black; head and feet orange; top of the 11th ring somewhat bulging, and the forepart of the body hunched up when at rest. Feeds on the grape.

United States.

HARRIS.

2. **E. unio** *Hübner.*

Smaller than *E. grata;* differs in having the stripe and band on its fore wings of a brighter purple brown color, the round and kidney-shaped spots contiguous to the former also brown, the olive-colored edging of the band wavy with a powdered blue spot between it and the triangular olive-colored spot on the inner margin, and a distinct brown spot on the inner hind angle of the posterior wings; all the wings beneath are broadly bordered behind with light brown, and the spots upon them are also light brown.

United States.

HARRIS.

DATANA WALK.

Body rather stout, pilose; hairs rather smooth. Proboscis short, not exceeding the breadth of the head. Palpi short, porrect, not extending beyond the head; second joint very much longer than the first; third acute, very minute. Thorax somewhat convex. Abdomen extending for one-fourth of its length beyond the hind wings. Legs stout, pilose; hind tibiæ with four rather long spurs. Wings broad or rather broad. Fore wings nearly straight along the costa, hardly angular at the tips; exterior border more or less oblique; three inferior veins; first and second united at the base; third rather remote. *Male.* Antennæ minutely pectinated; the branches successively but very slightly decreasing in length. *Female.* Antennæ minutely serrated.

1. **D. ministra** *Drury.* Figured in Drury, pl. 14. Sm. Abb. pl. 81.

Luteous-tawny. Thorax rather darker towards the hind part, which is pale testaceous. Pectus, abdomen and legs pale testaceous. Fore wings tawny, with four slender ferruginous bands; first band at one-fourth of the length, curved outward; second,

third and fourth bands oblique; second curved backward towards the costa, beyond the distal spot or spots, the space between it and the first a little darker than the wing elsewhere; third and fourth bands very slightly undulating; a more or less distinct streak between them, very near to the fourth; under side without bands. Hind wings a little paler than the fore wings; under side pale testaceous. *Male.* Fore wings with one discal brown spot. *Female.* Fore wings with two discal brown spots, the outer one larger than the other. Length of the body 10 lines; of the wings 26—27 lines.

United States.

WALKER.

2. D. contracta *Walk.* C. B. M. 1062.

Much resembling the preceding species, but with narrower fore wings. Luteous-tawny. Thorax brown towards the hind part, which is whitish testaceous. Pectus, abdomen and legs testaceous. Fore wings tawny, whitish testaceous about the base and along the outer side of the second, third and fourth bands; four slender brown bands; first much like that in *D. ministra*, but rather less convex; second more oblique, more retracted towards the costa, and nearer the first on the hind border; third and fourth also rather more oblique than in the preceding species; cilia brownish. Hind wings whitish, with testaceous borders. Length of the body 7 lines; of the wings 19 lines.

North America.

WALKER.

3. D.? anguina *Sm. Abb.* Figured in Sm. Abb. pl. 84.

Female. Pale luteous; thorax cinereous; abdomen and secondaries fawn color; primaries subferruginous, spotted with black; band and exterior margin whitish, base pale luteous.

Georgia.

Sm. Abb.

4. D.? aurora *Sm. Abb.* Figured in Sm. Abb. pl. 87.

Yellow; thorax rosy before; abdomen rosy at the apex; primaries rosy at the base and margin; secondaries of the *male* rosy, of the *female* white.

Georgia.

Sm. Abb.

NADATA Walker.

Body moderately stout, pilose; hairs rather smooth. Proboscis distinct, shorter than the breadth of the head. Palpi porrect, rather slender, not extending beyond the head; second joint full twice the length of the first; third minute conical. Thorax highly crested; the crest terminating in an acute cone. Legs rather slender, pilose; hind tibiæ with four long spurs. Wings rather broad. Fore wings with slight undulations along the exterior border, slightly acute at the tips; three inferior veins; first and second connected at the base; third rather remote. *Male.* Antennæ moderately pectinated, more than half the length of the body. Abdomen not extending beyond the hind wings. Fore wings almost straight along the costa, exterior border less oblique than in the female. *Female.* Third joint of the palpi more acute than in the male. Antennæ simple, hardly more than half the length of the body. Abdomen extending for one-fourth of its length beyond the hind wings. Fore wings slightly convex along the costa.

1. **N. gibbosa** *Sm. Abb.* Figured in Sm. Abb. pl. 82.

Tawny, whitish testaceous beneath. Fore wings very minutely covered with ferruginous flecks; a slightly oblique ferruginous band at one-third of the length, and another more oblique, at a little beyond two-thirds of the length; the outer border of the latter is more or less paler than the rest of the wing; two white discal dots, one behind the other, exterior border with whitish marks. Hind wings testaceous, whitish towards the costa, and with a slender indistinct tawny somewhat undulating discal band; exterior margin slightly tawny. Length of the body 7½—10 lines; of the wings 20—24 lines.

United States.

Walker.

Fam. ARCTIIDAE Herr.-Schaef. *Chelonides* Boisd.

Stature robust; ocelli conspicuous; maxillæ short submembranaceous, sometimes obsolete. Antennæ moderate,

of the female, when not nearly obsolete, bipectinate or ciliate, sometimes serrate or simple. Palpi small, pilose, often triarticulate. Abdomen stout, maculate. Wings entire, deflexed, variegated in color. Frenulum conspicuous. *Larvæ* with coarse hairs, growing in clusters or tufts from the tubercles in transverse rows on the body.

ORGYA Ochs.

Male. Body slender. Proboscis very short. Palpi short, stout, very hairy; third joint very small. Antennæ very deeply pectinated. Legs slender; hind tibiæ with two rather short apical spurs, or with four moderately long spurs. Wings broad. Fore wings with the first, second and third inferior veins near together. Hind wings extending beyond the abdomen.

1. **O. leucostigma** *Sm. Abb.* Figured in Sm. Abb. pl. 79.

The males have large ashen-gray wings, crossed by wavy darker bands on the upper pair, on which, moreover, is a small black spot near the tip, and a minute white crescent near the outer hind angle. The body of the male is small and slender, with a row of little tufts along the back, and the wings expand one inch and three-eighths. The females are of a lighter gray color than the males, their bodies are very thick, and of an oblong oval shape, and, though seemingly wingless, upon close examination two little scales, or stinted winglets, can be discovered on each shoulder.

Larva of a bright yellow color, sparingly clothed with long and fine yellow hairs on the sides of the body, and having four short and thick brush-like yellowish tufts on the back, that is on the fourth and three following rings, two long black plumes or pencils extending forwards from the first ring, and a single plume on top of the eleventh ring. The head, and the two little retractile warts on the ninth and tenth rings are coral red; there is a narrow black or brownish stripe along the top of the back, and a wider dusky stripe on each side of the body.

United States.

Harris.

2. **O. antiqua** *Linn.* Figured in most European works.

The male is of a rust-brown color, the fore wings are crossed by two deeper brown wavy streaks, and have a white crescent near

the hind angle. They expand about one inch and one-eighth. The female is gray, and wingless, or with only two minute scales on each side in the place of wings, and exactly resembles in shape the female of the foregoing species. The *larva* is yellow on the back, on which are four short square brush-like yellow tufts; the sides are dusky and spotted with red; there are two long black pencils or plumes on the first ring, one on each side of the fifth ring, and one on top of the eleventh ring; the head is black; and the retractile warts on top of the ninth and tenth rings are red.

United States and Europe.

HARRIS.

3. **O. leucographa** *Walk.* C. B. M.

Male. Obscurely fuscous; primaries paler, with a sub-basal streak, a costal ante-apical spot, two bands, the first wide before the middle, the second arcuate dark fuscous, and a white posterior spot. *Female.* Apterous.

Georgia.

WALKER.

4. **O. vetusta** *Boisd.* Am. Soc. Ent. 2me sér. X, 322.

Primaries fuscous, a paler band at the base and a white anal spot; secondaries fusco-rufescent.

California.

BOISD.

APANTESIS WALKER.

Female. Body fusiform, clothed with close smooth hairs. Head small. Head and thorax clothed with short hairs, lying close and smooth. Proboscis short. Palpi hairy, porrect; third joint conical, small. Antennæ minutely pectinated. Abdomen with very short hairs, extending to one-third of its length beyond the hind wings. Fore wings narrow, subfusiform, slightly convex along the costa; outer border slightly oblique and convex; hind angle very obtuse and much rounded; first, second and third inferior veins very near together at the base; fourth twice further from the third than the third from the first. Hind wings rather broader than the fore wings and hardly two-thirds of the length. Legs moderately stout; hind tibiæ with four spurs of middling length.

1. **A. radians** *Walk.* C. B. M. 632.

Female. Dark brown. Head clothed above with luteous hairs. Proboscis testaceous. Antennæ black. Thorax in front luteous with two brown stripes; middle part with two luteous stripes. Abdomen above testaceous towards the base and with two luteous stripes. Fore wings with testaceous borders, excepting the apical third part of the costal margin; a discal testaceous streak, extending from the base along one-fourth of the length of the wing, forked at its tip. Hind wings red towards the base; the outline of the red part very angular. Fore femora with a luteous spot on each. Length of the body .5 lines; of the wings 12 lines.

Georgia.

WALKER.

DEIOPEIA CURT. *Eyprepia* Ochs. *Euchelia* Boisd.

Palpi elongate, above recurved subsquamous; first article stout, second long; third short, ovate. Maxillæ much longer than the head. Antennæ simple in both sexes, rather short, those of the male subpilose below. Primaries oblong, subelliptic, truncated; secondaries subdiaphanous, strongly plicate. Legs moderate; tibiæ very short, hind tibiæ with four spurs at the apex.

1. **D. bella** *Linn.* Figured in Cram. Pop. Exot. II, 20, 109. Drury I, pl. 24. Nat. Lib. vol. XXXVII, pl. 24.

Primaries fine yellow, traversed with several irregular white bands, with a series of black dots in each and a regular row of black dots on the outer margin; fringe pure white. Secondaries scarlet, irregularly margined with black behind; fringe white, thorax nearly white, spotted with black; abdomen whitish; antennæ black, naked, setaceous.

Expands from an inch and a half to an inch and three-quarters.

United States.

HARRIS.

2. **D. aurea** *Fitch.*

Fore wings bright marigold yellow, with four bands of round pale sulphur-yellow spots upon a brilliant steel blue ground, the hindmost band almost upon the apex, its outer half abruptly widened and slightly united with the third band, which is the broadest and towards its outer end is abruptly narrowed and

almost interrupted. Its hind wings are transparent, with a dusky margin and blackish veins. Width one inch.

Georgia.

FITCH.

FAM. LITHOSIIDAE STEPH. *Lithosina* Her.-Schaef.

Body slender, elongate, no ocelli. Proboscis often longer than the head. Palpi not extending beyond the head, cylindrical, third article shorter than the second or not longer. Antennæ usually ciliate or simple. Thorax not crested. Abdomen not extending beyond the wings or very little. Wings often subelliptical; primaries narrow, with rounded apex; secondaries often twice as wide as the primaries. Frenulum conspicuous. Color yellow or gray, seldom black, sometimes with cross bands or rows of black points, occasionally confluent. In repose, the primaries are plicate; the secondaries folded close to the abdomen. *Larvæ* herbivorous, usually with hairy tubercles. *Pupæ* very short, with segments immovable.

EUSTIXIA WALKER.

Male. Body moderately long and wide. Palpi short. Antennæ setaceous, simple. Abdomen extending a little beyond the secondaries. Feet slender; wings not long; primaries nearly straight on the costal edge, oblique at the apical margin, the posterior angle subrotund.

1. E. pupula *Hübner.*

Male. Brownish-black, below whitish; wings whitish; primaries with four bands, secondaries with two, composed of black spots.

United States.

WALKER, C. B. M.

EUBOPHE HUBNER.

Male. Body slender. Palpi short. Antennæ slender, setaceous, simple, a little shorter than the body. Abdomen extending a little beyond the secondaries. Feet slender. Wings narrow,

rather long; primaries oblique at the apical margin; secondaries rounded, not angulate.

1. E. aurantiaca *Hübner.*

Orange; secondaries paler towards the base.
United States.

HÜBN.

MIOZA WALKER.

Body slender, rather short. Palpi straight, slender, a little shorter than the head; third joint linear, conical at the tip, a little shorter than the second. Antennæ slender, setaceous, very minutely pubescent. Abdomen extending as far as or a little beyond the hind wings. Legs slender; hind tibiæ with four long spurs. Wings long, narrow. Fore wings very slightly convex in front, conical at the tips, with a somewhat rounded angle behind; the three inferior veins approximate at the base. Hind wings with four inferior veins; third approximate at the base, fourth remote.

1. M. igninix *Walk.*

Pale red or saffron-color. Head white above, pale red on the vertex. Palpi with black tips. Antennæ black. Thorax white, with six black spots, one on the disk, two on each side, and one on the scutellum. Fore tibiæ and fore tarsi brown. Fore wings above white with black streaks on one-third of the breadth from the costa and on one-third of the length from the tips; in the rest of the wing there are five elongated black spots, two before the middle and three beyond the middle. Length of the body 3—3½ lines; of the wings 10—11 lines.

St. John's Bluff, E. Florida.

WALKER, C. B. M.

2. M. subfervens *Walk.*

Male. Pale red or saffron-color. Head and thorax white above. Antennæ white towards the base. Fore wings white above with many elongate brown points, and with two oblique bands of brown dots, one at one-fourth of the length, the other before two-thirds of the length. Length of the body 3 lines; of the wings 10 lines.

United States.

WALKER, C. B. M.

3. **M.? pupula** *Hübner.*

Orange; thorax white; primaries above marked with black, pale green, subroseous towards the apex.

United States.

WALKER, C. B. M.

PITANE WALKER.

Male. Body linear, moderately long and stout. Palpi pilose, very short; third joint very small. Antennæ moderately deeply pectinated, little more than half the length of the body. Abdomen not extending beyond the hind wings. Legs rather stout; hind tibiæ with four long spurs. Wings moderately broad, not long; fore wings straight along the costa, slightly oblique at the tips; hind angle somewhat rounded.

1. **P.? mediastina** *Hübner.*

Male. Black; disk of the thorax and abdomen at the end, luteous; primaries with a clavate postmedian band and seven white bands; secondaries luteous with a band and margins black.

Georgia.

WALKER, C. M. M.

CISTHENE WALKER.

Male. Body rather short, moderately stout. Palpi much shorter than the head; third joint conical, acuminated, less than half the length of the second. Antennæ stout, setose, setaceous, rather more than half the length of the body. Abdomen not extending so far as the hind wings; tip forcipated. Legs moderately stout; hind tibiæ with four rather long spurs. Wings moderately broad, not long. Fore wings very slightly convex in front, oblique at the tips, rounded and not angular behind; third inferior vein full twice further from the second than the second from the first; fourth nearly twice further from the third than the third from the second.

1. **C. subjecta** *Walk.*

Rose-color. Head black, rosy about the eyes. Palpi and antennæ black. Proboscis testaceous. Thorax with a black disk.

Legs mostly whitish, partly brown. Fore wings aeneous gray, with a fusiform rosy streak beyond the middle of the costa, and with a rosy discal stripe along more than half the length from the base, dilated and joining the hind border at each end. Apical third part of the hind wings aeneous gray. Length of the body $2\frac{1}{4}$—$2\frac{1}{2}$ lines; of the wings 7—8 lines.

Var. a. Costal streak of primaries wanting, discal stripe appearing only at its tip.

Var. b. Discal stripe of primaries replaced by a slender streak, which extends along the hind border and is slightly dilated at the tip.

United States.

WALKER.

CROCOTA Hübner.

Male and Female. Body moderately stout, not long. Palpi stout, porrect, pubescent, as long as the head; third joint slender, acuminated, not half the length of the second. Antennæ setaceous, slightly setose, rather stout, hardly or not more than half the length of the body. Abdomen not extending so far as the hind wings. Legs rather slender; hind tibiæ with four long spurs. Wings rather broad, not long. Primaries very slightly convex in front, slightly angular at the tips, oblique along the apical border, indistinctly angular behind; first, second and third inferior veins approximate at the base; fourth remote from the third.

1. C. ferruginosa *Walk.*

Ferruginous, paler beneath. Abdomen pale ferruginous, with a row of dorsal black dots. Secondaries pale ferruginous, with a blackish dot in the disk and two or three blackish spots along the border. Length of the body $3\frac{1}{2}$—4 lines; of the wings 10—11 lines.

Hudson's Bay.

WALKER.

2. C. brevicornis *Walk.*

Fawn color, or luteous fawn color. Antennæ black, short. Abdomen rose-color. Primaries rosy beneath. Secondaries rose-color, with an indistinct and sometimes quite obsolete brown stripe

on the hind border, and a brown dot in the disk. Length of the body $2\frac{1}{2}$—$3\frac{1}{2}$ lines; of the wings 8—10 lines.

United States.

WALKER.

3. **C. rubicundaria** *Hübner.*

Fulvous; wings sometimes with a discal fuscous spot; secondaries rufous, margined with black.

Var. a. Primaries tawny, with a slight brown dot in the disk. Secondaries red with a black discal spot and a broad black hind border.

Var. b. Secondaries partly red on the hind border.

Var. c. All the wings without discal spots.

Massachusetts.

WALKER.

GNOPHRIA STEPH. *Setina* SCHR. *Atolmis* HÜBNER.

Palpi moderate, recurved, subsquamous; maxillæ as long as the antennæ; antennæ simple; of the *male*, setaceous. Primaries narrow, of nearly equal breadth; secondaries opaque. Feet short, rather robust; tibiæ short, robust, hind tibiæ with four spurs.

1. **G. vittata** *Harris.* *Lithosia miniata* Kirby.

Deep scarlet; primaries with two broad stripes and a short stripe between them at the tip, of a lead color; secondaries with a very broad lead-colored border behind; the middle of the abdomen and joints of the legs of the same color.

Larva feeds on lichens, and may be found under loose stones in the fields in the spring. It is dusky and thinly covered with stiff, sharp, and barbed black bristles, which grow singly from small warts. Early in May it makes its cocoon, which is very thin and silky, and twenty days afterwards is transformed to a moth.

HARRIS.

DASYCHIRA STEPH. *Orgyia* OCHS.

Body generally stout. Palpi porrect, pilose, extending very little beyond the head; first joint short; third slender. Abdomen not or hardly extending beyond the hind wings. Legs stout; fore legs with very long hairs; hind tibiæ with four moderately long

spurs. Wings moderately broad, generally rather long. Fore wings slightly convex along the costa, hardly angular at the tips, oblique along the exterior border; interior angle more or less rounded; first and second inferior veins nearly contiguous. Antennæ of the male deeply pectinated; of the female, minutely. Female winged.

1. **D. achatina** *Sm. Abb.* Figured in Sm. Abb. pl. 77.

Crested; primaries cinereous, with a white streak before, intersected behind with a black arc terminating in an angular white point.

Georgia.

WALKER.

2. **D. rossii** *Curtis.*

Transparent gray. Fore wings with two blackish waved lines, forming a fascia across the middle, with a spot between them and a sinuated, abbreviated band beyond them. Hind wings cream-color, ochreous along the hind border, with a broad blackish margin.

Arctic America.

WALKER.

LAGOA WALKER.

Male. Body stout, short, very pilose. Proboscis obsolete. Palpi very short. Antennæ deeply pectinated, rather less than half the length of the body. Abdomen extending a little beyond the hind wings. Legs stout, thickly clothed with long hairs; hind tibiæ with short apical spurs. Fore wings moderately broad, not long, straight along the costa, rounded at the tips; second inferior vein as far from the first as from the third; fourth proceeding from the base of the wing.

1. **L. opercularis** *Sm. Abb.* Figured in Sm. Abb. pl. 53.

Male. Pale luteous. Head whitish on the vertex, brown in front. Antennæ white; branches brown, with white tips. Abdomen and hind wings testaceous. Legs partly clothed with

whitish hairs; tarsi black. Fore wings woolly, especially towards the base. Length of the body 6 lines; of the wings 13 lines.

Georgia.

WALKER.

2. **L. pyxidifera** *Sm. Abb.* Figured in Sm. Abb. pl. 54.

Testaceous; primaries with some fuscous and black flexuous discal streaks.

Georgia.

WALKER.

APPENDIX.

By BRECKENRIDGE CLEMENS.

SPHINGINA (in part).

Fam. ZYGAENIDAE.

The present family, together with *Glaucopididae*, *Aegeriidae* and *Sphingidae*, form the great group known as *Sphingina*. *Lithosides* forms another group of families, and should precede the family *Arctiidae*.

I am convinced that the limit of the family under consideration is much more restricted than is usually represented. It is made to include a variety of incongruent forms, which it is extremely difficult to unite under a common and satisfactory definition. And hence it may be, that the diagnoses to which I have had access are indefinite, and that the characters drawn from the most important parts of structure are modified by numerous exceptions. The family is therefore restricted here to two genera, one of which displays some of the characters of the succeeding family group.

In the fore wings the subcostal vein at its posterior end is curved downward so as to form, in connection with the median vein, a fusiform disk, and gives rise to *five nervules, two of which run to the costa, one to the tip, and two to the hind margin beneath the tip.* In *Zygaena*, the subcostal vein is not attenuated at the posterior end giving rise to the two lower nervules, but in *Procris?* (Clem.) it is attenuated from the third subcostal branch. The discal vein is short, angulated and rather attenuated, and receives the discal fold at its angle. The median vein is 4-branched and curves upward from the origin of the posterior branch. The fold of the wing is thickened and the submedian is simple.

In the hind wings the subcostal branch is bifid, *the lower branch being angulated at its base*, and from the angle arises an angulated, more or less oblique discal vein which receives the discal fold. The median vein is 4-branched and curves upward from the posterior branch. *Procris?* (Clem.) is with-

out a costal vein, and *Zygaena* has a costal vein bifid at the base, and is connected with the subcostal by an intercostal branch.

The antennæ are fusiform, sometimes pectinated, with branches shorter in the ♀ than in the ♂. The palpi are short, cylindrical and hairy, or very short, almost rudimental. The tongue is as long as the thorax beneath or almost wanting. Flight of the *imago* diurnal.

ZYGAENA Fabr.

Anthrocera *Scop.* Intr. Hist. Nat. I, 414; Steph.; Westw.

Fore wings rather narrow and elongated; their length exceeds that of the body somewhat; the tip of the wing is rounded and the hind margin obliquely rounded; the inner angle rounded and nearly opposite the middle of the costa. The subcostal nervure, or vein, and the median are adjacent in the basal third of the wing and diverge thence to form a markedly fusiform disk placed above the middle of the wing, and which reaches to the apical third. There are five subcostal nervules, the first arising near the middle of the disk, and the two others adjacent to each other at the posterior-superior angle of the disk; the third nervule, viz., the apical, is bifid from its middle, and from its origin the subcostal curves downward throwing off two nervules to the hind margin. The discal vein is short and angulated, and receives the discal fold. The median nervure is 4-branched, and curves upward from the medio-posterior branch, which arises at a point about midway between the first and second subcostal branches, to join the discal at the angle which receives the discal fold. The fold of the wing is thickened, and the submedian nervure is simple.

The hind wings are somewhat more than one-half the length of the fore wings; irregularly ovate, dilated at the inner angle. The disk is broad, irregularly fusiform, and extends to the apical third of the wing. The costal nervure is bifid at the base of the wing, and is connected with the subcostal at its middle by a *minute intercostal branch;* from this point the subcostal departs obliquely and divides into two branches at the end of the disk, the lower one being angulated. An oblique angulated discal nervure at the angle of the lower branch, receives the discal fold. The median is 4-branched, curving upward to join the discal from the origin of the posterior nervule.

Fore wings marked with spots or blotches.

Head and face pilose; without ocelli. Eyes rather large, round. Antennæ claviform, one-third less long than the fore wings, the tip without hairs or seta. Palpi short, scarcely ascending beyond the front, cylindrico-conical, pilose beneath, acute. Tongue corneous, and about as long as the thorax beneath.

Body moderately stout, hairy; the fore wings when closed extending beyond the tip of the abdomen. Legs slender; tarsi roughened with spines. The fore tibiæ with a rather long internal spine; the tibiæ of the posterior legs with four very small spines.

Larva fat, contracted, subcylindrical, slightly pubescent. Pupa inclosed in a tough cocoon, pointed at both ends. The larvæ feed exclusively on papilionaceous plants.

1. Z. onobrychis *Fabr.* Walker 96–7. Var. 1.

Fore wings shining blue, with six yellow spots margined with white, the posterior one red and semilunar. Hind wings yellow.

Georgia.

WALKER.

PROCRIS? FABR.

Fore wings somewhat fusiform. The subcostal vein *with two distinct, rather long* marginal nervules, with apical vein *simple*, with *two disco-central* nervules. The median 4-branched, the medio-posterior opposite the first marginal nervule and the two upper branches on the line of the discal vein, which is straight. The fold of the wing is thickened from the base to the tip. Submedian simple. Hind wings not as broad as the fore wings at their broadest part, ovate. The subcostal vein is bifid, the lower branch giving rise to a decided rather oblique discal vein, which is angulated above the medio-superior nervule, where it receives the discal fold. Median vein with four, equidistant nervules.

Head moderate, advanced, but without decided neck; with rather large ocelli. Face moderate, oblique and *projecting tuberculariy* at the base of the antennæ, and in the middle. Eyes small. Antennæ *incrassated at the tip, as long as the thorax beneath*, with

rather deep pectinations in the ♂, serrated or minutely pectinated in the ♀. Palpi *rudimental, tubercular.* Tongue rudimental.

Body rather thick, short. Patagia rather elevated, consisting of two transverse plates rounded above, making the prothorax more than ordinarily wide above. Abdomen ovate, without apical tuft, less long than the thorax beneath. Legs short and slender; fore tibiæ unarmed; hind tibiæ with two very minute apical spurs.

1. **P.? smithsoniana** *Clemens.* Proc. Acad. Nat. Sci., 1860, 540.

The entire insect is greenish-black; immaculate.

Texas. Capt. Pope's collection. From the Smithsonian Institution.

Fam. GLAUCOPIDIDAE.

Wings narrow, often limpid or with limpid spots. Fore wings equal in length to that of the body. Hind wings short, scarcely more than half as long as the fore wings, rounded, rarely angulated. In the fore wings the subcostal vein is only slightly arcuate from the base to the tip of the wing and subdivides into five or six branches, the two first of which, sometimes contiguous and sometimes separated, run to the costa. The origin of the discal and subcosto-inferior nervule *is a common one*, and the marginal nervules arise contiguous to each other and interior to it, or one interior and the other exterior. After the origin of these, the subcostal continues to the tip of the wing, and about midway subdivides into an apical and post-apical branch, the former of which is sometimes bifid at its tip. The median is 4-branched and curves upward from the 2d (medio-inferior); the 1st (medio-posterior) is separated at its origin from the others, and is curved. The discal fold is distinct, and the discal nervure extends nearly across the disk.

The hind wings are *without the costal nervure.* The subcostal is bifid, sometimes sending a nervule to the costa from the disk. *The median is usually likewise bifid, sometimes with the lower branch forked near its end.* In some genera, however, it is 3-branched. The discal vein is usually much curved and oblique, usually without a nervule to the hind margin, but sometimes with a medio-discal nervule, that is, with one on the side of the median system.

The antennæ are pectinated. Palpi usually curved, smooth and cylindrical. Tongue moderate, usually as long as the thorax beneath.

Flight of the *imago* diurnal.

TABLE OF GENERA.

Hind wings without a discal nervule;
  Median vein of hind wings bifid;
    Wings usually hyaline. GLAUCOPIS.
  Median vein of hind wings trifid;
    Subcostal vein with a marginal branch, discal vein vertical. ORMETICA.
Hind wings with a discal nervule;
  Median vein of hind wings bifid. EUCHROMIA.
  Median vein 3-branched. CYANOPLEPLA.

GLAUCOPIS FABR.

Wings most frequently narrow, sometimes ample; hyaline or limpid, with black borders or tips, and the veins covered with scales.

In the fore wings the subcostal nervure subdivides into two marginal nervules, a bifid apical branch and a post-apical branch; *the subcosto-inferior branch is usually the only one proceeding from the disk*, when it arises at its posterior-superior angle. Sometimes, however, the disk emits from four to six nervules(?). The median nervure is 4-branched. Hind wings without costal nervure. The subcostal is bifid from the disk, and the discal is without branches to the hind margin.(?) The median is bifid or bifid with the lower branch forked near its tip.

Head with ocelli. Antennæ most frequently bipectinated. Palpi moderate, generally ascending, usually longer than the clypeus.

Body linear, most generally slender, subcylindrical and more or less metallic. Patagia small. Legs with the tibiæ roughened with spines.

This genus is of considerable extent, and its limits are very undecided. I have only a single specimen belonging to it, and

hence cannot venture on making a more definite diagnosis than that given above. Systematists have divided it, however, into a number of groups, some of which may prove hereafter to be true genera, and the subdivision will assist the student in recognizing individuals.

Group **Isanthrene.**

Isanthrene *Hübner.* Verz. Schmett. 125.

Body cylindrical. Palpi rather long; second joint rather short and slender. Antennæ slightly pectinated beneath, serrated near the tips. Wings hyaline, more or less bordered with black, and in some species with a black band on the base of the disk. *The disk emits five veins*, discal fold distinct along the whole length. Abdomen linear. Legs rather stout; median and apical spines of the hind tibiæ of moderate length. Especially distinguished by the cylindrical abdomen.

WALKER.

1. G. chalciope *Hübner.* Samml. Ex. Schmett. 23, 235, f. 469, 470.

Blue Antennæ luteous. Abdomen with lateral white dots. Wings limpid, margined with black. Fore wings with a black band.

Havana.

WALKER.

Group **Poecilosoma.**

Poecilosoma *Hübner.* V. S. 126.

Body stout, convex, cylindrical, partly metallic. Antennæ slender, minutely pectinated to the tips. Wings hyaline, metallic at the base; fore wings with black tips; discal fold distinct. Legs moderately stout; median and apical spurs of the hind tibiæ very small.

WALKER.

1. G. multicincta *Walker.* C. B. M. 163.

Male. Dark brown, linear, cylindrical, partly covered with blue scales. Head with some white hairs above and thickly clothed with white hairs beneath. Palpi white beneath, straight, rather short; third joint very small. Antennæ black, moderately deeply

pectinated. Thorax with two white bands in front, and with a crimson stripe on each side of the wing; a few scattered blue hairs. Breast with white hairs. Wings limpid, rather broad. Fore wings with black tips and borders, on the latter some blue scales; a black band across the end of the discal areolet where the veinlets hardly form an angle; no trace of the discal fold. Borders of the hind wings mostly black. Abdomen with two crimson spots at the base, and with a row of crimson spots along each side; a slender white band on the hind border of each segment; under side white, with short crimson and black bands along the apical half, and with a tuft of crimson hairs at the tip. Legs brown, mostly clothed with white; coxæ blue beneath; fore tibiæ with long spines beneath; middle and apical spurs of the hind tibiæ rather long. Length of the body 6 lines; of the wings 16 lines.

St. Domingo.

WALKER.

Group **Laemocharis.**

Laemocharis *Boisd.* Herr.-Schaeff. *Erruca* Walker. C. B. M. 165.

Body linear, cylindrical, rather slender. Palpi not rising to the vertex; third joint slender, more than half the length of the second. Antennæ minutely pectinated. Wings moderate, limpid; fore wings with black tips; discal fold distinct. Legs slender; hind tibiæ with four small spurs.

WALKER.

1. G. pertyi *Boisd.* Herr.-Schaeff. Lep. Ex. Nov. Ser. I, f. 249.

Black. Head with two white dots. Abdomen with four basal luteous dots, and two lateral interrupted white stripes. Wings limpid, margined narrowly with black.

Georgia.

WALKER.

Group **Cosmosoma.**

Cosmosoma *Hübner.* Harris, Descr. Cat. N. Amer. Sphing. 37.

Wings mostly hyaline. The subcostal vein of the fore wings is adjacent to the external margin, with two subcosto-marginal nervules, one from the disk arising at a point midway between the origin of the medio-posterior branch and its penultimate, the other exterior to the disk, midway between it and the origin of the post-

apical nervule. The apical branch beyond its middle sends off the post-apical nervule, and near its tip an apical nervulet to the costa. Median vein 4-branched. Hind wings about half as long as the fore wings; without costal vein; subcostal bifid from the origin of the discal vein, which is very obliquely inclined towards the base of the wing and abruptly curved above the median, where it receives the discal fold. Median vein bifid exterior to the disk, with the lower branch furcate at the tip.

Head moderate, smooth, neck not distinct; with ocelli. Face smooth and vertical. Eyes moderately prominent. Antennæ rather more than half as long as the body, pectinated to the tips in the ♂, less so in the ♀. Palpi rather stout, curved, exceeding the face, smooth, but hairy at the base; basal and middle joints nearly equal; terminal small and conical. Tongue equal to the thorax beneath.

Body scarcely equal in length to the fore wings, rather slender, nearly linear. Patagia small. Legs moderately stout, smooth; fore tibiæ with a moderate, concealed spur from the base; hind tibiæ with four rather small spurs.

CLEMENS.

1. **G. omphale** *Hübner.* *Ægeria omphale* Say, Am. Ent. II, pl. 19, lower fig.

Bright red. Antennæ black, with white tips. Head blue. Thorax most frequently striped with black. Abdomen with a black dorsal stripe, and the tip black, varied with blue. Wings margined with black and with black veins.

Florida; Mexico near Jalapa.

CLEMENS.

2. **G. impar** *Walker.* C. B. M. 169.

Black. Head bright blue in front. Thorax luteous, which hue extends over the basal part of the borders of the wings; an interrupted blue band in front of the thorax. Wings limpid; a black stripe extending along the borders, and very broad at the tips of the fore wings; a large slightly curved black spot at the tip of the disk. Abdomen luteous at the base, near which are two dorsal blue spots; three rows of blue spots at the tip. Legs dark testaceous. Length of body 7 lines; of the wings 20 lines.

Mexico.

WALKER.

3. **G. tyrrhene** *Hübner.* Ex. Schmett. 23, 242, f. 433–4.

Orange-colored. Head blue. Antennæ black. Abdomen with two blue stripes (interrupted in the ♀), and the tip blue. Wings limpid, with the base orange-colored, tip ferruginous. In the male the fore wings have a discal orange-colored spot.

Jamaica.

WALKER.

Group **Marissa.**

Marissa *Walker.* C. B. M. 174.

Body short. Palpi rising above the head; third joint long, linear, shorter than the second. Antennæ of the male very broadly pectinated. Wings ample, limpid, with black borders; fore wings about twice the length of the hind wings, with the discal fold distinct. Legs slender; hind tibiæ with four minute spurs.

1. **G. columbina** *Fabr.* *Ennomia columbina* Hübn. Ex. Schmett. 8, 5, f. 9, 10.

Bright red. Antennæ black. The disk of the thorax black, with a white line. Abdomen with a dorsal black stripe, with transverse white lines. Wings limpid, margined with black; fore wings with a spot near the disk and the tip red.

Jamaica.

WALKER.

EUCHROMIA HUBNER.

Wings more or less narrow and elongated, opaque or marked with a few hyaline or limpid spots. The wing structure and outline of the fore wings are more markedly sphingiform than in the genus *Glaucopis.* The subcostal vein gives rise to two marginal branches from the hinder part of the disk to the post-apical branch midway between the origin of the subcosto-inferior branch and the tip of the wing; the subcosto-inferior and discal vein arise from the subcostal at a common point. There is no disco-central branch. The median is 4-branched, with the medio-posterior remote from the other branches. The submedian simple. The hind wings are rather more than half as long as the fore wing; *without costal nervure;* subcostal bifid from the origin of the discal, which is obliquely curved towards the base of the wing and gives rise to

a disco-central branch below the middle. The median is two-branched(?) from the insertion of the discal.

Head with ocelli. Antennæ of the males most frequently pectinated, sometimes plumose, of the females sometimes subpectinated or serrated. Palpi of moderate length, sometimes short, generally curved and cylindrical.

Body rather slender, cylindrical and smooth. Abdomen, with a prominent tubercle on each side of the basal segment, generally smooth, sometimes tufted along each side. Legs usually slender and rather long.

The same uncertainty is connected with the present limits of this genus as with the preceding one. In general structure, the species included in it are sometimes allied to the *Lithosides* and again to the *Bombycidae* or to the European genus *Syntomis*. It has been divided into a number of groups so as to indicate their special peculiarities with accuracy.

Synopsis of Species.

A. Discal areolet not narrow.
B. Antennæ of the ♂ pectinated or plumose.
C. General structure like that of *Syntomis*.
D. Abdomen not tufted along each side.
E. Palpi not porrect.
F. Body and wings more or less metallic.
G. Hind tibiæ not ciliated.
i. Hind wings rounded or hardly angular.
j. Body hardly hairy.
k. Wings unspotted.
l. Wings bright red. **lichas.**
K. Wings very generally spotted or wholly blackish with green or blue reflections.
l. Allied to the *Lithosides* in structure. Antennæ pectinated to the tips. Wings broad. Abdomen rather short, extending very little beyond the hind border of the hind wings.
m. Abdomen more or less metallic.
n. Hind wings partly red. **fastuosa.**
nn. Hind wings bluish at the base. **bella.**
l'. Body narrow, cylindrical. Wings long and narrow, covered with opaque or limpid spots. Abdomen long, extending for half its length beyond the hind wings. Resembles *Syntomis*.

m. Wings with luteous or yellow spots.
n. Fore wings not marked with blue.
o. Abdomen not metallic.
p. Abdomen with many bands.
q. Fore wings with two spots and a streak. **ferox.**
qq. Fore wings with five dots. **ipomaeae.**
mm. Wings with white or limpid spots.
o. Hind wings limpid, black margined. **fenestrata.**
oo. Hind wings with two or more spots.
p. Fore wings with six white spots. **vulcanus.**
pp. Fore wings with three white spots. **subcyanea.**
*l*¹. General color black, with golden green stripes or rows of spots. Antennæ pectinated.
m. Thorax with green streaks and dots.
n. Legs black. **interrupta.**
*l*². Body short. Antennæ pectinated. Wings shorter and broader than preceding groups and opaque.
m. Hind wings with a hyaline stripe.
n. Abdomen banded with yellow. **ventralis.**
nn. Abdomen with glittering green spots. **quadrigutta.**
GG. Hind tibiæ ciliated.
i. Color black. **plumipes.**
ii. Color pale. **pretus.**
CC. General structure like that of *Bombycides*.
d. Body not metallic.
f. Wings with various shades of brown and white or fawn color.
y. Hind wings blue.
h. Abdomen luteous. **dryas.**
gy. Hind wings not blue.
h. Abdomen brown or black.
i. Hind wings not or hardly limpid towards the base.
j. Fore wings with cuneiform marks. **sylvius.**

Group **Empyreuma.**

Empyreuma *Hübner*. Verz. Schmett. 120.

Body metallic, rather long, spotted, and scarcely hairy. Antennæ setaceous, much more than half the length of the body, thickly and rather deeply pectinated to the tips. Wings long, moderately broad, wholly opaque and squamose, not spotted. Hind wings not angular. Abdomen nearly linear, not petiolated. Legs stout, not plumose. Tibiæ with short spurs. This group approaches nearest to *Zygaena* in its form and in the color of its wings.

WALKER.

1. **E. lichas** *Fabr.* Hübn. Samml. Ex. Schmett. 12, 21, f. 41, 42.

Black, with shining green reflection. Wings bright red, with a median green streak and white punctures. Abdomen black, with two golden bands.

Cuba, St. Domingo.

WALKER.

Group **Belemnia.**

Belemnia *Walker*, 211.

Body rather long and narrow. Body and wings brilliantly metallic. Antennæ setaceous, more than half the length of the body, thickly and rather deeply pectinated to full three-fourths of the length in the male. Fore wings long, moderately broad, opaque and squamose, with red or yellow semi-hyaline spots towards the tips. Hind wings angular on the hind border near the base. Abdomen linear, not petiolated. Legs slender, not plumose. Tibiæ with short spurs.

WALKER.

1. **E. eryx** *Fabr.* *Sphinx inaurata* Cram. Pap. III, 67, pl. 140, f. E, F.

Wings black. Fore wings golden towards the base, with a discal spot and the abdomen beneath, blood-red.

In this species the following varieties of color occur:—

Var. a. Head and thorax with gilded or golden green spots. Fore wings gilded towards the base, with a red spot in the disk. Abdomen with a cupreous stripe, bright green towards the base and bright blue towards the tip on each side.

Var. b. Like *Var. a.* Abdomen with gilded green spots on each side along the whole length.

Var. c. Spots on the fore wings yellow. Red beneath the abdomen extending partly over the sides above on the hinder half.

West Indies, South and Central America.

WALKER.

Group **Automalis.**

Automalis *Walker*, 213.

Approaches the *Lithosiides* in structure. Body more or less metallic. Third joint of the palpi very short. Antennæ pectinated to the tips. Wings broad, opaque, more or less spotted, metallic at the base. Abdomen rather short, extending very little

beyond the hind wings. Fore tibæ dentate beneath; middle and apical spurs of the hind tibiæ small.

WALKER.

1. **E. fastuosa** *Walker*, 215.

Black. Head, palpi, thorax in front and three dorsal stripes bright green. Antennæ minutely pectinated beneath to the tips. Fore wings dark brown, golden green at the base, and with two bright red spots, one near the base, the other in the middle near the fore border, the last also appears beneath where there is another spot beyond it. Hind wings deep purplish blue, bright red along the middle part of the hind border; this red stripe widens in breadth towards the tip of the wing. Femora and tibiæ mostly golden green; fore coxæ and fore tibiæ white on one side. Length of the body 5—6 lines; of the wings 18—20 lines.

Jamaica.

WALKER.

2. **E. bella** *Guér.* Icon. Reg. An. Ins. Texte, 502.

Shining violet-blue. Antennæ black. Wings black. Fore wings with a yellow streak at the base and a spot in the disk of the same hue, and a blue streak near the base towards the hind border.

Mexico.

WALKER.

Group **Hippola.**

Hippola *Walker*, 222. *Syntomeida?* Harris, N. A. Sphing. 36.

Male. Body cylindrical, slender. Palpi very hairy at the base, moderately long; third joint small, conical at the tip, not more than one-fourth of the length of the second. Antennæ rather deeply plumose. Wings long and narrow, mostly opaque; discal areolet-veinlet forming a right angle; discal fold distinct along the whole length. Abdomen long, linear; appendages small. Legs moderately long; fore tibiæ furrowed beneath; middle and apical spurs of the hind tibiæ rather small.

1. **E. ferox** *Walker*, 223.

Male. Dark purple. Head with tawny hairs in front and with a short orange band behind. Palpi with black hairs towards the

base. Antennæ dark blue, white above towards the tips. Thorax orange with two purple stripes on each side. Fore wings dark bluish-green, purple along the hind borders, with two small yellowish white spots between the first and third inferior veinlets, and with a very short yellowish-white streak before the middle of the discal areolet, and only visible beneath. Hind wings purple, partly bluish-green, with a broad white streak near the base and towards the hind border. Abdominal segments above and beneath with orange bands which are connected on each side; appendages testaceous. Legs bluish-purple; coxæ beneath with orange tomentum, which also appears, but much more slightly, on the femora. Length of the body 7 lines; of the wings 22 lines.

United States.

WALKER.

2. **E. ipomaeae** *Harris.* *Sesia ipomaeae* Œmler. *Glaucopis* (*Syntomeida*) *ipomaeae* Harris, N. A. Sphinx, 36. Var.? *E. ferox?*

Body tawny orange. Antennæ and head black, the latter spotted with orange. Thorax with a broad black stripe on the shoulder covers and a transverse spot of the same hue behind. Fore wings greenish-black, with three yellowish-white dots near the front margin and two others close together beyond the middle. Hind wings violet-black, with a transparent colorless spot at the base. Abdomen with the incisures black. Legs violet-black; coxæ beneath and a spot on the thighs orange-colored. Expands one inch and three-quarters.

Georgia.

HARRIS.

3. **E. fenestrata** *Stoll.* Cram. Pap. Exot. V, 140, pl. 30, f. 5. Drury, Ins. I, 54, pl. 25, f. 3. Westw. ed. Drury, I, 53, pl. 25, f. 3.

Black. Fore wings with two limpid, approximated spots before the middle of the wing, and behind the middle a short, indented limpid band curved externally. Hind wings limpid, margined with black. Feet red.

Jamaica.

WALKER.

Group **Endera.**

Endera *Walker*, 228.

Color partly metallic. Body nearly linear, not broad. Palpi moderately long; second joint rather short. Antennæ pectinated

to the tips. Wings long, rather narrow, with limpid spots. Hind wings not angular. Legs rather long and slender; hind tibiæ with two moderately long spurs; first at three-quarters of the length; second at the tip.

1. E. vulcanus *Walker*, 228.

Black, clothed with black hairs. Thorax with a white spot on each side, and with a white band in the hinder part beneath. Fore wings with a white dot on each side at the base and with eight limpid spots; two near the base; two in the disk, and four forming a short band nearer the tip. Hind wings with three limpid spots; two near the base, and one beyond the middle. Abdomen with two rows of white spots along each side, and with a few red hairs at the tip. Fore femora clothed with red hairs. Length of the body 9 lines; of the wings 24 lines.

Mexico.

WALKER.

2. E. subcyanea *Walker*, 230.

Black, clothed with black hairs. Fore part of the thorax blackish-green on each side in some aspects, and with six white dots, two on each side and two nearer the disk; a white dot behind the scutellum. Fore wings very narrow, with three large white hyaline spots which have a slight opaline lustre, and form a very slightly curved stripe on the disk; third spot intersected; under side brilliant blue towards the base and along the hind border. Hind wings brilliant blue in front and wholly so beneath, with three hyaline white spots; basal spot of moderate size; the other two small. Femora and tibiæ with blue scales; a white streak on each of the posterior femora, and a larger one on each of the fore coxæ. Length of the body 9? lines; of the wings 25 lines.

Mexico.

WALKER.

Group **Calonota.**

Calonotos *Hübner*. Verz. Schmett. 123.

Color partly metallic. Body rather slender. Palpi moderately long; second joint small. Antennæ pectinated to the tips. Wings long and narrow. Hind wings not angular. Legs rather

stout; median and apical spurs of the hind tibiæ of moderate length.

WALKER.

1. **E. interrupta** *Walker*, 1628.

Male. Black, with a metallic green tinge. Thorax with white or green marginal dots in front, and with two dorsal streaks of the same hue. Abdomen with a white dot at the base, and with interrupted gilded green bands; under side with two lateral rows of white spots, which decrease in size hindward. Legs piceous. Wings black, narrow. Fore wings with four elongated limpid spots, the hind one of the first pair nearer the base of the wing than the fore one, which, like the exterior pair is intersected by the black veins. Hind wings with the disk limpid towards the base, and with an exterior intersected limpid spot. Length of the body $7\frac{1}{2}$ lines; of the wings 18 lines.

Mexico.

WALKER.

Group **Antichloris.**

Antichloris *Hübner.* Verz. Schmett. 124.

Body rather narrow. Palpi moderately long; second joint small. Antennæ rather deeply pectinated, serrated towards the tips. Fore wings opaque, unspotted, rather broad, slightly pointed at the tips, obtusely angular on the hind border. Hind wings obliquely truncated and slightly angular at the tips; hind border a little sinuated. Peculiar in the form of the hind wings.

1. **E. eriphia** *Fabr.* *A. phœnonoë* Hübn. Samml. Ex. Schmett. 9, 8, f. 15–6. *A. caca* Samml. Ex. Schmett. 24, 67, f. 133, 4.

Var. Male. Gilded green. Head crimson behind. Tongue and antennæ black. Palpi black, white beneath. Thorax crimson on each side in front. Pectus with white spots on each side. Abdomen above black, with three rows of triangular gilded green spots; under side with two lateral interrupted white stripes, which extend from the base to the middle. Fore coxæ white beneath. Wings dark brown. Hind wings whitish in front.

Mexico, West Indies.

WALKER.

Group **Horamia.**

Horamia *Hübner.* Verz. Schmett. 124.

Wings narrow. Fore wings much longer than the body. The subcostal vein is adjacent to the external margin, with two marginal nervules from the hinder end of the disk, the first opposite the penultimate branch of the median, the second forked at about its middle. The apical branch gives rise at about its middle to the post-apical. The subcosto-inferior and the discal vein arise at a common point, the latter slightly curved. Median vein 4-branched, the posterior remote from the penultimate. Hind wings equal to the length of the body. Without costal vein. Subcostal vein bifid from the margin of the discal vein, which is very obliquely inclined to the base and suddenly curved about the middle of the disk, where it receives the discal fold; immediately beneath this arises a medio-discal nervule. Median vein bifid from the disk.

Head rather large, smooth, free; with ocelli. Face narrow. Eyes rather large, prominent. Antennæ shortly pectinated or serrated to the tip, whence it is moniliform, and more or less dilated or fusiform about the middle. Palpi curved, ascending to the middle of the face; basal joint hairy beneath; middle and terminal joint smooth and cylindrical. Tongue about as long as the thorax beneath.

Body cylindrical, smooth. Patagia small. Abdomen obtuse, with a prominent tubercle on each side of the basal segment. Legs slender and long; fore tibiæ with a moderate spur from the base; hind tibiæ towards the ends and the hind tarsi plumose. Hind tibiæ with two short spurs.

CLEMENS.

1. **E. plumipes** *Drury.* *Aglaope plumipes* Westw. ed. Drury, II, 51, pl. 27, f. 3.

Blackish. Thorax marked with white. Abdomen banded with white. Hind tibiæ plumose.

Var.? Palpi short; third joint small. Black, indistinctly tinged with blue. Head, thorax, base of the wings, and abdomen towards the base with white dots. Wings blackish-brown. Abdominal segments with white bands. Legs partly covered with white scales; hind tibiæ with a white band before the middle, beyond

which they are deeply plumose with black hairs to the tip; hind tarsi white, black and plumose towards the base.

Mexico.

WALKER.

2. **E. pretus** *Cram.* *Sphinx adscita pretus* Cram. Pap. Exot. II, 121, pl. 175, f. E, F. *Horamia pretus* Hübn. Samml. Exot. Schmett. Addend. pl. f. 1—4. *E. plumipes* Clemens, Proc. Ac. Nat. Sci., Nov. 1860, 546.

Fawn-colored. Antennæ banded with black. Prothorax and basal portion of the abdomen whitish. Hind wings brownish. Fore wings testaceous. Femora and tibiæ black at the tips.

West Indies.

Var. Bluish-black. Antennæ with orange-yellow tips. Palpi orange-yellow; face, orbits and a spot between the antennæ of the same hue, the former with a central blackish stripe. Thorax with four spots on the disk orange-yellow or yellow, and four on the prothorax, one on each side and two central, and a stripe along the upper edge of the tegulæ, of the same hue. Abdomen banded with more or less decided orange-yellow, with a short, transverse white stripe at the base above between the tubercles, and with two white bands at the base beneath, the first of which is extended on the sides. Breast with three white marks on each side. Wings concolorous dark brownish, with a white spot on the costa at the base. The fore coxæ with an orange-yellow stripe and fore tibiæ striped externally with the same hue. Hind coxæ orange-yellow; femora black; tibiæ orange yellow banded with black at the tips, and ciliated with long hairs; tarsi orange-yellow and plumose to the tips.

This species was erroneously described in the Proceedings of November, 1860, as *plumipes*. Mr. Walker, on page 1632, describes varieties that approach this very nearly, but in making up the paper for the Proceedings, I overlooked them.

Cuba, West Indies.

CLEMENS.

Group **Amycles.**

Amycles *Walker*, 253, 1633.

Male. Body rather long. Palpi rather short; third joint very small. Antennæ rather deeply pectinated for nearly two-thirds of the length, setaceous and abruptly simple thence to the tips.

Wings rather short, very narrow. Fore wings distinctly angular on the hind border. Abdomen slightly tapering from the base to the tip. Legs moderately stout; spurs of the hind tibiæ rather long.

Female? Antennæ simple and beset with short bristles along the whole length. Wings short, extremely narrow, less distinctly angular.

WALKER.

1. **E. anthracina** *Walker*, 253, 1633.

Male. Purplish black. Prothorax with a red dot on each side beneath. Fore wings towards the tips dingy white, between which and the black there is a slight brown interval; fringe black. Hind wings dark brown, dingy white in front. Abdomen with an oblong oblique shining white spot on each side at the base.

Female? Fore wings with a whitish band at three-fourths of the length, blackish thence to the tips. Length of the body 5—6 lines; of the wings 12—14 lines.

Mexico.

WALKER.

Group **Eucerea.**

Eucereon *Hübner.* Verz. Schmett. 123.

Body rather stout, nearly cylindrical. Palpi moderately long, curved; third joint very minute. Antennæ slender, minutely pectinated to the tips. Wings opaque, spotted. Legs moderately stout; median and apical spurs of the hind tibiæ rather long. This group connects the *Glaucopididae* with the *Bombycidae.*

1. **E. sylvius** *Stoll.* Cram. Pap. Exot. V, 65, pl. 14.

Fore wings brown or fawn-color, with many blackish streaks. Abdomen in part red or luteous or yellow.

Var. a. Fore wings brown; areolets full of blackish marks of various size and shape, but mostly cuneiform. Abdomen partly red.

Var. b. Fore wings fawn-color, their spots less large and less numerous. Abdomen partly red.

Var. c. Like *Var. b*, but abdomen partly luteous.

Mexico.

WALKER.

2. **E. dryas** *Cram.* *Phalaena dryas* Cram. Pap. Exot. I, 110, pl. 70, f. C.

Black. Abdomen luteous, with dots on the sides and the tip, black. Fore wings dark brown. Hind wings blue, broadly margined with brown.

West Indies.

WALKER.

Group ———————?

1. **E. bimaculata** *Fabr.* Mant. Ins. II, 106, 51; Ent. Syst. III, 1, 402, 54. *Sphinx zygaena bimaculata* Gmel. ed. Syst. Nat. I, 5, 2398, 145.

Wings concolorous black. Fore wings with two yellow spots. Hind wings with two white spots.

America, North?

WALKER.

2. **E. achemon** *Fabr.* Sp. Ins. II, 162, 24; Mant. Ins. II, 104, 29; Ent. Syst. III, 395, 31. *Sphinx zygaena achemon*, Gmel. ed. Syst. Nat. I, 5, 2396, 131.

Wings brown, with two white spots. Abdomen blue, banded with yellow.

Jamaica.

WALKER.

3. **E. dares** *Cram.* *Sphinx adscita dares* Pap. Exot. I, 76, pl. 48, f. F.

Blackish-brown. Fore wings white, with a large brown spot on the disk, and a smaller one of the same hue on the margin.

West Indies.

WALKER.

Group **Mastigocera.**

Mastigocera *Harris.* N. A. Sphinges, 35, note.

Dr. Harris' description of the characters of this group is so indefinite that it is scarcely possible to determine its relationships. I think, however, it belongs to the genus *Euchromia* and to the group *Horamia.*

1. **M. vespina** *Harris.* Cat. N. A. Sphinges, 35.

Light rust-brown. Wings immaculate. Collar, first abdominal segments above, third below, and a triangular spot on each side, white. Head, thickened part of the antennæ, edge of the thorax behind the collar, and a large triangular spot on each side of the

second abdominal segment, black. Breast black, spotted with white. First and second pairs of thighs, except at the base, middle of the hind pair, and extremity of the tibiæ, black. Expands $1\frac{1}{2}$ inch to $1\frac{3}{4}$.

St. Thomas, W. I.

HARRIS.

ORMETICA CLEMENS.

Wings opaque. Fore wings rather narrow, equal in length to that of the body; hind margin very obliquely rounded, with the inner angle opposite the middle of the costa. The subcostal vein is adjacent to the costa, and gives rise to a marginal nervule from the disk nearly opposite the penultimate branch of the median vein, and another exterior but near to the disk. The post-apical arises just exterior to the second marginal nervule, and the apical is bifid at its posterior third. The discal vein and the subcosto-inferior arise at a common point, the former very obliquely inclined to the base, but straight. The median is 4-branched. Hind wings *extremely short*, not one-half as long as the anterior; without costal vein; subcostal vein arched, with a marginal nervule from the point of origin of the discal, and bifid at the tip much exterior to the cell. Discal vein *vertical*. Median 3-branched.

Head rather large, smooth, free; with small ocelli. Face tapering, smooth, vertical. Eyes rather large, prominent. *Antennæ wanting*. Palpi curved, cylindrical, ascending to the middle of the front, stout, smooth; basal joint short, rather hairy beneath; middle joint smooth, rather thickened in the middle and about four times as long as the apical joint; terminal joint very short, ovate. Tongue as long as the thorax beneath.

Body not metallic, rather stout, equal in length to the fore wings, smooth. Patagia moderate, decumbent, and overlapping the meso-thorax. Abdomen tapering at the tip, more than one-half as long as the body beneath. Legs smooth, rather stout; tarsi roughened with spines; fore tibiæ with a stout internal spur from the base; hind tibiæ with four spurs.

1. **O. sphingiformis** *Clemens.*

Bluish-black. Face with a blue band. Body with a yellow stripe on each side extending from the head to the tip of the abdomen. Palpi blackish, whitish at the base and on the second joint beneath. Fore wings with the extreme costa from the base to beyond the middle yellow, with a broad stripe of the same hue from the base to the hind margin beneath the tip, somewhat contracted behind. Hind wings, exterior half yellow, interior half black. The under surface of the wings the same as above. Abdomen beneath with a central yellow stripe. Legs black; fore coxæ each with a yellow spot; femora white internally; tibiæ striped with white. Length of the body 9 lines; of the wings 19 lines.

The structure of this insect shows marked affinities to the group of *Sphinges.*

Mexico, near Jalapa.

CLEMENS.

CYANOPEPLA CLEMENS.

Female? Fore wings much longer than the body, moderately broad, rounded at the tip, and very oblique along the margin. The subcostal vein adjacent to the external margin, with a single marginal nervule from near the hind end of the disk, and a second marginal nervule just exterior to it. The apical branch near its exterior third sends off a post-apical nervule, and near the tip a nervulet to the costa. The subcosto-inferior nervule and the discal vein arise at a common point, the latter angulated. Median vein 4-branched, with the posterior nervule rather remote from the others, and the origin of the first subcosto-marginal nervule. Hind wings rather more than one-half as long as the fore wings, nearly equal to the length of the body. Without costal vein. Subcostal bifid at the origin of the discal vein, which is much curved. Median vein 4-branched, the superior branch is medio-discal, the two middle ones from a common base, the posterior remote.

Head moderate, smooth, without distinct neck; without ocelli. Face rather narrow, smooth. Eyes rather small, moderately prominent. Antennæ more than one-half as long as the body, minutely

pectinated or serrated beneath. Palpi curved, ascending rather above the middle of the face, smooth, slightly hairy at the base; middle joint rather more than twice longer than the basal joint; terminal joint very minute, ovate. Tongue equal to the thorax beneath.

Body metallic, cylindric, scarcely slender, smooth. Patagia rather small, somewhat erected. Abdomen less than one-half as long as the body beneath. Legs rather slender, smooth; fore tibiæ with a short, concealed middle spur; hind tibiæ with four rather short spurs. Tarsi minutely spinous.

1. C. cruenta *Clemens.*

Black. Palpi blue. Head and body metallic blue. Fore wings with a large crimson spot at the base, extended to the middle of the disk and to the fold beneath, and another of the same hue, oval and obliquely placed in the median nervules; inner margin at the base and a streak along the submedian vein metallic blue; cilia at the tip white. Hind wings dark bluish-black, immaculate. Length of the body 7 lines; of the wings 20 lines.

Mexico, near Jalapa.

CLEMENS.

LITHOSIDES.

Antennæ most frequently moderately long, slender, setaceous. Tongue very often longer than the head. Ocelli very often absent. Palpi not longer than the head, cylindrical, third joint shorter than the second, or not longer. Body slender, elongated. Thorax not crested. Wings very often subelliptical, posterior often folded and slightly enfolding the abdomen. Fore wings rounded at the tips.

The wing structure of the species included in this group is so diverse that I have been unable to draw up a diagnosis which will apply to it. The insects arranged under this group, compose beyond doubt more than one natural family, but with the limited number of specimens at my command I cannot undertake the division of it.

Fam. I. CTENUCHIDAE.

Group I.

Hind wings without costal vein. The subcostal vein bifid from the origin of the discal, or posterior to it (*Acoloithus*), the lower branch more or less angulated towards its base. Discal vein simple, angulated usually beneath the middle of the disk, receiving a more or less thickened discal fold. Median vein 4-branched, with the posterior sometimes remote from its penultimate. In the fore wings the subcostal vein is not remote from the costa and its branches are decumbent, except in *Acoloithus*.

ACOLOITHUS Clemens.

The following insect greatly resembles *Americana* in appearance and almost exactly in ornamentation. It must, however, be very distinct from it. The wings are extremely narrow. Hind wings broader than the fore wings, less ovate than in *Americana*, and rounded at the interior basal angle; *length rather more than that of the body.* The disk of the fore wings is closed by a rather faint, irregularly oblique vein, *with one disco-central nervule*, and angulated at the medio-superior nervule, where it receives a rather faint discal fold. The subcostal vein with three equidistant, moderately erect marginal nervules *from the disk*, with the apical vein *simple.* Median vein 4-branched, with the posterior nervule and the marginal opposite at their origins. The fold is thickened and the submedian vein simple. In the hind wings the subcostal vein shows a tendency to separate into two veins from its point of bifurcation towards the base of the wing and resembling two veins crossing each other; exterior to the point of bifurcation and a little behind the middle of the lower branch arises a decided, curved discal vein which receives, just above the medio-superior nervule, a decided or thickened discal fold. The median vein is 4-branched, with the two posterior branches equidistant from the second one.

Head moderate, free; smooth; with large ocelli. Face broad, rounded. Eyes rather small, round and scarcely prominent. An-

tennæ nearly as long as the body, moderately pectinated in the ♂, minutely pectinated in the ♀. Palpi equal to the front, filiform, porrected, distinctly 3-jointed and with joints nearly equal; terminal joint obtuse. Tongue about one-half as long as the thorax beneath.

Body short, rather slender, not metallic. Patagia very minute. Abdomen *as long as the thorax beneath*, not tufted at the tip and scarcely tufted along the sides, with a minute, lateral tubercle on the basal segment. Legs extremely slender and rather short; fore tibiæ with a slender tibial spur from the middle; hind tibiæ with two minute apical spurs.

1. **A. falsarius** *Clemens.*

Black. Prothorax fulvous, especially on the sides, *with a point on the median line black.* Hind wings rather thin.

Pennsylvania; Illinois, from Mr. Kennicott.

CLEMENS.

AGLAOPE LATR.

Wings extremely narrow. Hind wings ovate-lanceolate, narrower than the fore wings; length much less than that of the body; length of the fore wings somewhat more than that of the body. The disk of fore wings closed by a very faint, irregular vein, with *two disco-central nervules;* subcostal vein with a single marginal nervule from the posterior end of the disk and with the apical branch *trifid* near the tip of the wing or *bifid* with a long fork. Median vein 4-branched, with the posterior scarcely remote from the penultimate. Fold of the wing thickened from the base to the tip. Submedian with a short fork at the base of the wing. Hind wings without costal nervure; subcostal bifid, with an oblique discal vein arising near the base of the lower branch, and angulated above the medio-superior nervule, where it receives the discal fold. Median vein 4-branched, with nervules nearly equidistant.

Head rather small, free, smooth; with large ocelli. Face smooth, rounded, rather narrow. Eyes rather small, scarcely pro-

minent. Antennæ with bases approached, much shorter than the body, rather deeply pectinated in the ♂, less pectinated in the ♀. Palpi very minute, filiform, drooping, with only two distinct joints; terminal joint acute. Tongue about as long as the thorax beneath.

Body extremely slender, cylindrical, not metallic. Patagia cylindrical, minute. Abdomen without lateral tubercle, tufted at the tip and along the sides. Legs extremely slender; fore tibiæ without tibial spur; hind tibiæ with two very minute apical spurs.

1. **A. americana** *Boisd.* Griff. An. Kingd. Lep. *Procris americana* Boisd., S. G. Lep. I, pl. 16, f. 7; Guer. Icon. Règ. An. Ins., pl. 84, bis, f. 11. *Procris dispar* Har., Cat. *P. americana* Har., Cat. N. A. Sphin., p. 35. *Ctenucha americana* Walker, 286.

Blue-black. Prothorax above entirely fulvous or orange.
Massachusetts, New York, Pennsylvania, Georgia.

Subcostal vein exterior to the disk, trifid; apical branch with a long fork.

2. **A. coracina** *Clemens.*

The specimens are imperfect and denuded. The entire insect is black, without the orange-colored prothorax of *Americana*.

Texas. Capt. Pope's collection. From Smithsonian Institution.

CTENUCHA Kirby.

Wings broad, or narrow, elongate-trigonate. Fore wings with the subcostal vein giving rise near the posterior end of the disk to a single marginal nervule, and another exterior to the disk and nearer to it than to the post-apical nervule, which is given off near the apical nervulet. The subcosto-inferior nervule and discal branch from a common stalk, the latter straight and the discal fold received by the medio-superior nervule. The median vein 4-branched, the posterior much behind the marginal branch, and rather remote from the penultimate. Hind wings without costal vein; subcostal bifid, with the discal given off from the fork and receiving the discal fold at its angle. Median vein 4-branched,

with the posterior remote from the other branches, which are aggregated.

Head moderate, free, neck distinct, slightly hairy above; with ocelli. Face smooth, rather narrow. Eyes moderately large, prominent. Antennæ about one-half as long as the body, deeply pectinated in the ♂, slightly pectinated in the ♀. Palpi porrect, exceeding the front somewhat, squamose; basal joint slightly hairy; the basal and middle joint nearly equal; the terminal shorter, acuminated. Tongue as long or nearly as long as the thorax beneath.

Body cylindrical, slender, more or less metallic. Patagia scale-like. Hind wings equal to the body in length. Abdomen with a lateral tubercle on the basal segment. Legs rather slender; fore tibiæ with a short tibial spur; hind tibiæ with four moderately long spurs.

TABLE OF SPECIES.

Head above orange-yellow.	
Fore wings with costa luteous.	
Cilia white; wings broad.	**latreillana.**
Cilia blackish; wings narrow.	**fulvicollis.**
Head red or crimson.	
Fore wings with four yellowish white stripes.	**venosa.**
Fore wings with a white costal and discal stripe.	**ruficeps.**
Fore wings without stripes.	
Wings blackish; fringes white.	**rubriceps.**

Wings broad; palpi porrect; post-apical nervule interior to apical nervulet.

1. **C. latreillana** *Kirby.* Fauna Bor. Am. IV. 305, 1.

Dark brown or blackish-brown. Palpi pale orange, tips blackish. Face dark blue. Head above, prothorax beneath and the tegulæ in front pale orange. Thorax and abdomen dark metallic blue. Wings with whitish cilia, except in the middle. The fore wings in the ♀ have the extreme costa luteous.

United States, Canada.

CLEMENS.

Wings moderately broad; antennæ moderately pectinated.

2. **C. rubriceps** *Walker*, 283.

Dark brown, black beneath. Head and palpi towards the base clothed with bright red hairs. Wings fringed with white. Fore wings with blackish veins. Hind wings bluish-black. Abdomen of the ♂ sericeous green above.

New Grenada.

WALKER.

Wings moderately broad; post-apical nervule interior to apical nervulet.

3. **C. venosa** *Walker*, 284.

Dark brown, black beneath. Head above, prothorax beneath, clothed with bright red hairs in the ♂, and with yellow hairs in the ♀. Face dark blue. Palpi blackish, base bright red. Patagia and tegulæ in front striped with yellow, the latter likewise on the superior edge. Wings fringed with white. Fore wings with four yellowish-white stripes; the first costal, second on the subcosto-inferior nervule, third on the median vein, extended to the two middle branches; fourth on the submedian vein. Hind wings and abdomen of the ♂ dark bluish-black, of the ♀ blackish.

Mexico, Texas. Capt. Pope's collection. Smithsonian Institution.

CLEMENS.

4. **C. ruficeps** *Walker*, 284.

Blue. Head above and thorax in front beneath clothed with crimson hairs. Palpi black, with crimson hairs towards the base. Thorax with a lappet on each side and a white spot on each shoulder. Legs white beneath. Wings blackish-brown, blue at the base. Fore wings with a white costa and a white interrupted stripe extending from the base to near two-thirds of the length in the disk. Hind wings with a white discal stripe tapering from the base to half the length.

Mexico.

WALKER.

Wings long, narrow; fore wings opaque, post-apical exterior to apical nervulet; hind wings hyaline in the middle. Palpi curved.

5. **C. fulvicollis** *Hübner.* *Glaucopis* (*Ctenucha*) *semidiaphana* Harris, Cat. N. A. Sphin., 38, 4.

Slate-colored or blackish-brown. Antennæ bluish-black. Palpi, basal joint ochreous, the other joints blackish. Head above, patagia, prothorax beneath, tegulæ in front and a stripe beneath the fore wings ochreous or orange. Fore wings with a luteous stripe along the extreme costa. Wings with cilia of the general hue. Abdomen bluish-black, scarcely metallic.

Illinois. Mr. Kennicott.

CLEMENS.

GROUP II.

Hind wings without costal vein. Subcostal vein bifid, the lower branch strongly angulated and parallel to the upper, the angle giving rise to a doubly angulated discal vein, which sends off a disco-central branch from the upper angle and receives the thickened discal fold at the lower one. Median vein 4-branched. In the fore wings the subcostal vein is rather remote from the costa and its marginal branches are erected; the discal with two central nervules.

MALTHACA CLEMENS.

Fore wings rather broad, obovate; the discal cell broad behind, fusiform. The subcostal vein sends two short nearly erect marginal nervules to the costa, and from the superior angle of the disk arise two long nervules, on a short common stalk, the lower one of which is the apical, but delivered rather above the tip. The discal vein is rather faint and gives rise to two disco-central nervules, the upper one rather on the costal side of the wing. Median vein 4-branched, the posterior nervule arising a little behind the first marginal branch. The fold is thickened and the submedian shortly forked at the base. Hind wings ovate; as broad as the fore wing and in length equal to that of the body. Without costal vein. Subcostal is furcate, the lower branch giving rise at an obtuse

angle to a thickened discal vein, which is angulated above the medio-superior nervule, where it receives the discal fold, and above this is given off a single disco-central nervule. Median vein 4-branched, with branches equidistant, except the two superior ones.

Head moderate, free, vertex rather elongated, smooth; ocelli large. Face moderately broad, rounded, slightly protuberant. Eyes rather small, scarcely prominent. Antennæ with bases almost united, rather thick, but tapering at the tips, pectinated. Palpi extremely short. Tongue about one-half as long as the thorax beneath.

Body slender, cylindrical. Patagia minute, rolled. Abdomen not tufted at the tip or on the sides, about one-half the length of the body beneath. Legs slender; fore tibiæ with a short concealed spur on its middle; hind tibiæ with two extremely minute apical spurs.

1. **M. perlucidula** *Clemens.*

Blackish-brown. Wings slightly transparent. Fore wings with the basal half luteous *above the fold.* Hind wings luteous along the costa from the base to the middle.

Illinois, Mr. Kennicott. Maryland, Dr. Morris.

CLEMENS.

FAM. II. LYCOMORPHIDAE.

Hind wings without costal vein. Subcostal bifid, the lower branch slightly angulated near its base, giving rise to an oblique, simple discal vein. Median vein 3-branched, with branches equidistant, the medio-superior branch receiving the discal fold. In the fore wings is rather remote from the costa and its marginal branches rather erect.

LYCOMORPHA HARRIS.

Wings narrow. Fore wings nearly fusiform. Near the posterior end of the disk the subcostal vein gives rise to two marginal nervules and two nearly equidistant exterior to the disk. Without post-apical nervule. The subcosto-inferior nervule and the discal

arise on a common stalk, the latter angulated in the middle and receiving the discal fold. The median vein is 4-branched, the posterior arising at a point opposite the middle of the space between the first and second marginal nervules. Hind wings without costal vein. Subcostal bifid near the tip, the lower branch giving rise to an oblique discal. Median vein 3-branched, the superior nervule receiving the discal fold.

Head smooth, free, without ocelli. Face rounded. Eyes moderate. Antennæ a little shorter than the body, biserrated or very minutely pectinated. Palpi short, little exceeding the clypeus, cylindric, porrected; the basal joint long, nearly equal to the front; the middle and terminal joints equal, very short and ovate. Tongue a little longer than the thorax beneath.

Body slender, nearly cylindrical, not metallic. Patagia scale-like. Hind wings equal in length to the body. Legs rather slender; fore tibiæ with a short concealed tibial spur; hind tibiæ with *one* middle spur and two moderate apical spurs.

1. **L. pholus** *Fabr.* Sp. Ins. II, 166, 49.

Bluish-black. The tegulæ and the basal fourth of the wings luteous.

Nova Scotia, Massachusetts, Pennsylvania.

CLEMENS.

2. **L. dimidiata** *Herr.-Schaeff.* *Pyromorpha dimidiata* Lep. Ex. Sp. Nov. Ser. I, f. 222.

Black. Fore wings yellow at the base. [Is it distinct from *L. pholus?*]

Georgia.

FAM. III. MELAMERIDAE.

This family has much affinity to the *Glaucopididae* and also to the *Pyralites*. The wings are very generally more or less black, occasionally with a metallic hue, very frequently adorned with bright colors or partly limpid.

JOSIA Hübner.

Body generally nearly linear and cylindrical, varying in length and stoutness. Palpi variable as to length; in some species much shorter, in others a little longer than the head; third joint varying from one-eighth to one-half of the length of the second. Antennæ of the male generally more or less pectinated, sometimes simple; of the female generally simple, occasionally serrated. Abdomen extending as far as the hind wings, or beyond them. Legs mostly slender; hind tibiæ very generally with four spurs of various length; middle pair wanting in a few species. Wings black, generally narrow, adorned with yellow, luteous, or white stripes, bands or spots.

Group **Thyrgis.**

Thyrgis *Walker*, 316.

Fem. Body cylindrical, nearly linear, moderately long and slender. Palpi a little longer than the head; third joint linear, more than half the length of the second. Antennæ minutely serrated. Abdomen obconical towards the tip, not extending beyond the hind wings. Legs slender; hind tibiæ with four short spurs. Wings broad, moderately long.

1. J. **tribuna**, *Hübner*. *Ephialtias tribuna* Exot. Schmett. 24, 246, f. 491, 2.

Luteous. Head, disk of the thorax and abdomen, with a dorsal black stripe. Wings black. Fore wings with a luteous stripe at the base and an oblique luteous band behind the middle of the wing. Hind wings with a broad luteous stripe.

Cuba.

WALKER.

DIOPTIS Hübner.

Body cylindrical, slender, generally long and linear. Palpi varying in length, not longer than the head; third joint more or less shorter than the second. Antennæ of the male generally pectinated, occasionally serrated or simple; of the female sometimes pectinated, more often simple. Abdomen extending as far as the

hind wings, and most often beyond them. Hind tibiæ with four spurs of various length, very rarely with two spurs. Wings mostly limpid, generally long and narrow, broad in some species.

Group **Euagra.**

Euagra *Walker*, 323.

Body cylindrical, slender, linear, rather long. Palpi ascending, as long as the head; third joint conical, very small, about one-sixth of the length of the second. Antennæ minutely pectinated to seven-eighths of the length in the male, simple in the female. Abdomen extending from one-fourth to one-half its length beyond the abdomen. Legs slender; fore tibiæ not dentated; hind tibiæ with four moderately long spurs. Wings rather long and narrow.

1. **D. hœmanthus** *Walker*, 324.

Bright blue. Prothorax beneath and head clothed with crimson hairs. Head white in front. Palpi crimson towards the base. Abdomen and legs white beneath. Abdomen with a tuft of black hairs at the tip; sexual appendages large, testaceous. Wings deep black, blue towards the base. Fore wings with an oblique elongato-triangular white hyaline band in the disk beyond the middle; this band is attenuated towards the hind border and approaches nearer to it than to the fore border, and contains no apparent veins. Hind wings with a narrow white hyaline discal stripe which extends from the base nearly to the hind border and is traversed obliquely by a black vein near its tip. Length of the body 5 lines; of the wings 15 lines.

Mexico.

WALKER.

Group **Hyrmina.**

Hyrmina *Walker*, 331.

Body cylindrical, linear, very slender, rather long. Palpi ascending, curved, shorter than the head; third joint pointed, not one-fourth of the length of the second. Antennæ of the male rather deeply, of the female minutely, pectinated. Abdomen extending a little beyond the hind wings of the male, and nearly as far as them in the female. Legs slender; fore tibiæ of the male slightly channelled and not dentated beneath; hind tibiæ with four

small spurs. Wings moderately long, rather broad; fore wings with three inferior veins.

1. **D. vinosa** *Drury*. Ex. Ins. I, 47, pl. 23, f. 4. *Sphinx vinosa* Drury App. 4.

Wings grayish-diaphanous. Fore wings with the anterior and posterior margin reddish-yellow, with a large external spot, white in the middle margined with black. Hind wings, *fem.*, with a submarginal reddish-yellow band.

Jamaica.

WALKER.

Group **Lauron.**

Lauron *Walker*, 333.

Body cylindrical, linear, slender, rather long. Palpi straight, porrect, as long as the head; third joint acuminated, nearly one-third of the length of the second. Antennæ closely pectinated; branches of moderate length in the male, very short in the female. Abdomen extending a little beyond the hind wings in both sexes or not extending beyond them in the females of some species. Legs very slender; fore tibiæ not dentated; hind tibiæ with two very minute apical spurs. Wings long, rather broad, more or less hyaline; three inferior veins.

1. **D. ergolis** *Walker*, 335.

Black. Thorax and the costa of the fore wings along the basal half and a short, oblique band, red. Fore wings with the disk at the base subhyaline, an abbreviated, oblique band near the tip, white.

Jamaica.

WALKER.

CHRYSAUGE HÜBNER.

Group **Flavinia.**

Flavinia *Walker*, 369.

Body slender, of moderate length, nearly linear and cylindrical. Palpi porrect, shorter than the head; third joint acuminated, less than one-third of the length of the second. Antennæ of the male deeply pectinated, of the female simple. Abdomen hardly extend-

ing beyond the hind wings in the male, shorter in the female. Legs slender; hind tibiæ with two small apical spurs. Wings of moderate length, rather narrow.

1. **C. dimas** *Cram.* Pap. Exot. I, 91, pl. 59, f. C.

Whitish. Head, thorax in front and hind wings, red. Fore wings with the costa red, with a median, oblique thickly spotted black band.

West Indies.

WALKER.

URAGA WALKER.

Male. Body nearly linear and cylindrical, moderately stout and long. Palpi longer than the head; third joint lanceolate, a little shorter than the second. Antennæ moderately pectinated. Abdomen extending a little beyond the hind wings. Legs slender; hind tibiæ with four small spurs. Wings of moderate length, rather broad. Fore wings rounded and not angular on the hind border.

1. **U. hœmorrhoa** *Walker*, 465.

Black. Head and prothorax clothed with crimson hairs. Palpi crimson, with black tips. Abdomen blue, crimson towards the tip beneath and with a slender crimson stripe on each side. Femora blue. Fore wings with a narrow, linear, straight, slightly oblique whitish band with testaceous borders at two-thirds of the length. Hind wings bluish beneath towards the base. Length of the body $6\frac{1}{2}$ lines; of the wings 15 lines.

Jamaica.

WALKER.

FAM. IV. PERICOPIDAE.

This family is composed of large species, which often have pale dots on the head and thorax, and whose wings are ample and frequently more or less vitreous. It is connected with the *Melameridae*, and has some affinities with the *Arctiidae*.

PERICOPIS Hübner.

Body nearly linear and cylindrical, moderately long and stout. Head and thorax of the male hairy, the latter thick. Palpi more or less ascending, hairy in the male; third joint acuminated in the male, conical in the female, about one-third of the length of the second. Antennæ little or not more than half the length of the body, pectinated moderately or minutely in the male, very slightly or serrated in the female. Abdomen of the male slightly compressed, much narrower than the thorax, extending for one-third of its length beyond the hind wings; of the female obconical at the tip, extending for one-fourth of its length or less beyond the hind wings. Legs moderately stout; hind tibiæ with two minute apical spurs. Wings long, rather broad, more or less semihyaline; four inferior veins.

Walker.

1. **P. eurocilia** *Cram.* Pap. Exot. II, 126, pl. 178, f. C.

Ferruginous. Head, thorax in front and abdomen spotted with white. Thorax and abdomen on the sides striped with yellow. Wings with marginal white dots. Fore wings with a black stripe near the base, with a short, oblique black band in front, and the tip of the wing black; also a broad median yellow band, surrounding a black spot, abbreviated and incised behind. Hind wings black, red at the base, with ferruginous discal streaks.

West Indies.

Walker.

2. **P. leucophæa** *Walker*, 352.

Wings quite opaque in the female.

Blackish-brown. Antennæ very minutely pectinated. Thorax with several white dots in front. Fore wings with a crimson dot on each at the base. Hind wings with a row of crimson spots near the hind border, close to which there is a row of white dots. *Male.* Abdomen with a luteous tip. Fore wings with two gray slightly oblique irregular nearly connected semi-hyaline bands, the subapical one clearer than the first. *Fem.* Last abdominal seg-

ment with a luteous margin. Length of the body 9—10 lines; of the wings 24—28 lines.

Mexico.

WALKER.

COMPOSIA HÜBNER.

Body nearly cylindrical, rather stout, of moderate length. Palpi vertical, shorter than the head; third joint less than half the length of the second. Antennæ of the male slightly pectinated, of the female minutely pectinated. Abdomen oblanceolate in the male, fusiform in the female, extending as far as the hind wings. Legs rather slender; fore tibiæ excavated beneath; hind tibiæ with two minute apical spurs. Wings long, rather narrow with semihyaline spots.

1. **C. sybaris** *Cram.* Pap. Exot. I, 112, pl. 71, f. E.? De Beauv. pl. 24, f. 7. *Composia credula* Hübn. Samml. Ex. Schmett. II, Lep. III, Phal. II, Ver. viii. Coll. B, Var. II, f. 1—4.

Black, white beneath. Body and wings thickly dotted with white. Fore wings with four nearly square crimson spots.

West Indies.

WALKER.

EUCYANE HÜBNER.

Body nearly cylindrical and linear, rather stout, moderately long. Palpi ascending as long as the head; third joint linear, rather more than half the length of the second. Antennæ of the male moderately pectinated, of the female serrated. Abdomen hardly extending to the hind border of the hind wings in the male, a little shorter in the female. Legs moderately stout; hind tibiæ with four small spurs. Wings ample; fore wings with a semi-hyaline band; four inferior veins.

Wings very broad.

1. **E. pylotis** *Drury.* Ins. Exot. II, 9, pl. 5, f. 3. *Callimorpha? pylotis* Westw. ed. Drury II, 11, pl. 5, f. 3.

Blackish-blue. Abdomen luteous beneath, with the hind borders

black. Fore wings with a broad, white median band; cilia at the tip white. Hind wings with white cilia.

Mexico.

WALKER.

FAM. V. NYCTEMERIDAE.

Some of the genera, like a few of the *Pericopidae* and of the *Chalcosiidae*, have much resemblance to the *Rhopalocera*. The body is slender and the wings ample, and they have likewise a general resemblance to some of the *Geometrites*.

CARALISA WALKER.

Male. Body hardly stout. Tongue elongate. Palpi porrect, extending far beyond the head; third joint elongated, acuminated, much more than half the length of the second. Antennæ moderately pectinated, much more than half the length of the body. Abdomen extending as far as the hind wings. Legs slender; hind tibiæ with four rather short spurs. Wings moderately broad. Fore wings straight in front, rounded at the tips, very oblique along the exterior border; first, second and third inferior veins nearly contiguous; fourth remote.

1. **C. editha** *Walker*, 1661.

Male. Deep blue. Head crimson beneath, white about the eyes. Palpi crimson at the base. Disk of the abdomen with a short broad crimson stripe, which tapers in front; under side crimson. Wings with broad black borders; cilia white. Length of the body 6 lines; of the wings 18 lines.

West Indies.

WALKER.

EUDULE HÜBNER.

Body slender, nearly linear and cylindrical, rather long. Palpi porrect, rather shorter than the head; third joint conical, not more than one-fourth of the length of the second. Antennæ of the male

minutely pectinated, of the female serrated. Abdomen generally extending beyond the hind wings. Legs slender; hind tibiæ with four spurs of moderate length. Wings long and narrow; fore wings with four inferior veins.

1. **E. variegata** *Walker*, 380.

Crimson. Head black, white about the eyes and with white dots above. Antennæ and palpi black, the latter black beneath. Abdomen black, with a white band which is widest beneath on each segment. Legs black, white beneath. Fore wings with black-bordered veins towards the base, in the middle with a black oblique band which does not extend towards the fore border, but is dilated and contains a white dot towards the hind border; apical fourth part black with three or four white dots in a transverse line. Hind wings veined with black, and with broad white dotted black borders. *Male.* Hind wings black, streaked with white beneath.

West Indies.

WALKER.

PSYCHOMORPHA HARRIS.

Body slender, hairy at the tip. Palpi slender, nearly horizontal, extending a little beyond the clypeus, covered with loose hairs so as to conceal the joints. Tongue moderate, spirally rolled. Antennæ in the male pectinated on both sides, the pectinations rather short, simple in the female. Wings short, somewhat triangular, with the outer margins rounded; discal areolet of the hind wings short, closed by a sinuous vein. Abdomen not extending beyond the hind wings. Legs short, hairy; spurs of the hind tibiæ three, slender, nearly concealed by the hairs.

1. **P. epimenis** *Drury*, App. III. Exot. Ins. III, 39, pl. 29, f. 2. See p. 136.

MELANCHROIA HÜBNER.

Body slender, of moderate length, nearly linear and cylindrical. Palpi porrect, hairy, shorter than the head; third joint conical,

nearly half the length of the second. Antennæ closely pectinated; branches long or of moderate length in the male, very short in the female. Abdomen not extending as far as the hind wings. Legs slender; hind tibiæ with four spurs. Wings broad, not long, generally black with semi-hyaline white spots.

Spurs short, near together.

1. **M.? cephise** *Cram.* Pap. Exot. IV, 182, pl. 381, f. E. Hübner, Samml. Exot. Schmett. II, Lep. II, Phal. II, Ver. vii. Hyp. A. Sphing. 17, f. 1—4.

Deep black. Head, prothorax, sides of the thorax in front and breast clothed with luteous hairs. Palpi, legs and hind borders of the abdominal segments whitish beneath. Wings fringed with white, and with an elliptical white spot on each tip; veins somewhat cinereous. Length of the body 5 lines; of the wings 18 lines.

Mexico, West Indies, Central America.

WALKER.

2. **M. inconstans** *Geyer.* Samml. Exot. Schmett. V, 17, 431, f. 861–2.

Male. Black. Thorax with luteous spots. Wings bluish-black, at the base beneath luteous or red. Fore wings with white borders.

Mexico.

WALKER.

FAM. ———— ?

VIRBIA WALKER.

Allied to the *Noctuidae.* Body rather short, moderately stout, nearly linear and cylindrical. Palpi stout, straight, porrect, a little shorter than the head; third joint very small. Antennæ simple in both sexes. Abdomen not extending beyond the hind wings. Legs rather stout; hind tibiæ with two very minute apical spurs. Wings rather short and broad. Fore wings distinctly angular; third superior vein trifurcate; first and second inferior veins near together at the base.

1. **V.** luteilinea *Walker*. C. B. M. 471.

Brown. Palpi at the base and tongue testaceous. Antennæ black. Abdomen on each side with a slight luteous stripe which tapers from the base towards the tip. Fore wings ferruginous above and luteous beneath for more than half the length from the base, and with a reddish line along the costa. Hind wings luteous with broad black borders which are of equal breadth from the tip of the fore border to the tip of the inner border. Length of the body 4 lines; of the wings 11 lines.

Mexico.

Fam. VI. LITHOSIIDAE.

In the hind wings the costal and subcostal veins have a common origin in the posterior third of the wing. The subcostal is bifid beyond the origin of the discal, which is sometimes doubly angulated, giving rise to a disco-central branch from the lower angle, and sometimes simple and curved. Median vein 3-branched. In the fore wings the subcostal vein is remote from the costa, and the marginal branches rather erect.

NUDARIA? Haw., Steph.

Wings rather broad, semi-diaphanous, rounded. In the fore wings the subcostal vein forms a large subcostal cell over the discal vein, giving rise about the middle of the cell above to a marginal nervule, and beneath to the subcosto-inferior and discal vein, the latter having a disco-central nervule. At the apex of the cell behind, the vein becomes trifid, dividing into a marginal, post-apical and apical nervules, the latter with a nervulet from its middle. Hind wings about equal to the body in length; without costal vein; subcostal vein with a marginal nervule arising from the disk near the discal vein, and becoming bifid exteriorly at a point remote from the discal vein; with a disco-central nervule. Median 3-branched, with the posterior nervule somewhat interior to the origin of the marginal nervule.

Head free, rather small, smooth; without ocelli. Face smooth, rather narrow, clypeus prominent. Antennæ setiform, moderately

long, scarcely ciliated in the males. Palpi slender, slightly curved, but little exceeding the clypeus, slightly hairy at the base; the basal joint twice larger than the middle; terminal joint minute, ovate. Tongue as long as the thorax beneath.

Body slender. Patagia nearly obsolete. Legs rather long and slender; fore tibiæ unarmed; hind tibiæ with four spurs, the middle pair short.

Eggs globular, pale yellow; producing larvæ one week after deposition. The larva on escaping from the egg is geometriform, *with ten legs.* This refers to the species described below which differs sufficiently in structure from the European *N. mundana*, it appears to me, to authorize the separation of our species from the group containing the European species. It may belong to the *Geometrina.*

1. **N. mendica** *Walker*, 576.

Pale yellowish. Fore wings with the costa at the base frequently touched with ochreous, with two irregular oblique blackish, sometimes pale gray, bands, composed of large spots; one on the middle of the disk, and the other crossing the nervules, and a single spot of the same hue near the hind margin in the medio-central interspace, sometimes connected with the posterior band.

Pennsylvania, New York.

WALKER.

LERINA WALKER.

Male. Body short, thick, very hairy. Palpi thick, very short, hairy; third joint very small. Tongue very short. Antennæ rather deeply pectinated. Abdomen extending as far as the hind wings. Legs moderately stout; hind tibiæ with two rather long middle spurs and two minute apical spurs. Wings narrow, rather long. Fore wings straight in front, slightly rounded and not angular behind; first and second inferior veins almost contiguous at the base; third about six times nearer to the second than to to the fourth.

1. **L. incarnata** *Walker*, 477.

Black, clothed with black hairs. Head above, thorax and abdomen towards the tip thickly clothed with crimson hairs. Palpi, antennæ and legs black. Thorax with a black dorsal stripe, not extending to the front. Wings metallic bluish-green, not hairy. Length of the body $5\frac{1}{2}$ lines; of the wings 16 lines.

Mexico.

WALKER.

APISTOSIA HÜBNER.

Male. Body nearly linear, rather stout, moderately long. Palpi stout, very much shorter than the head; third joint conical, very small. Tongue of moderate length. Antennæ moderately pectinated. Abdomen extending a little beyond the hind wings. Legs stout; hind tibiæ with four long spurs. Wings moderately long and broad. Fore wings very slightly convex in front, obtusely angular behind; first and second inferior veins united at the base; third rather more than four times nearer to the second than to the fourth.

WALKER.

1. **A.? terminalis** *Walker*, 478.

Body bluish purple. Head, fore part of the thorax, tip of the abdomen and fore coxæ crimson. Palpi shorter than the head; third joint conical, less than one-fourth of the length of the second. *Antennæ wanting.* Abdomen extending for one-third of its length beyond the hind wings. Legs purplish-black, moderately stout. Wings black, tinged with green and purple, rather long and narrow; first and second inferior veins of the fore wings near together at the base; third full twice further from the fourth than from the second. Length of the body 6 lines; of the wings 19 lines.

Mexico.

WALKER.

The characters of this and of the following species, of which the specimens described are deprived of their antennæ, partly differ from those of *Apistosia*.

2. A.? multifaria *Walker*, 479.

Allied to *Euchromia?* Metallic blue. Head, prothorax and sides of the thorax clothed with rosy hairs. Abdomen extending very little beyond the hind wings. Fore coxæ, knees and tips of the tibiæ white. Palpi red, very much shorter than the head; third joint conical, very small. Wings black, rather long and narrow, tinged with blue towards the base; costa and fringe mostly white; first and second inferior veins very near together at the base; third full four times further from the fourth than from the second. Length of the body 7 lines; of the wings 20 lines.

California.

WALKER.

ARDONEA WALKER.

Male. Body rather slender, nearly linear, moderately long. Palpi hairy, much shorter than the head; third joint conical, not more than one-fourth of the length of the second. Antennæ moderately pectinated. Abdomen elongate-fusiform, extending for one-fourth of its length beyond the hind wings, forcipated at the tip. Legs rather slender; hind tibiæ with four long spurs. Wings rather long and narrow. Fore wings hardly convex in front, slightly angular behind; first and second inferior veins united at the base; third very near the second; fourth twice further from the third than the third from the second.

1. A. munda *Walker*, 1680.

Female. Deep blue. Head, and fore part of the thorax and of the breast crimson. Palpi crimson, with black tips. Antennæ black. Abdomen extending for about one-third of its length beyond the hind wings. Wings moderately broad; fringe white, with a black interval on the middle of the exterior border of each wing, and another towards the interior angle of the hind wings.

St. Domingo.

WALKER.

HYPOPREPIA HÜBNER.

Female. Body stout, rather short, elongato-subfusiform. Head rather small. Palpi stout, very much shorter than the head; third

joint acuminated, not half the length of the second. Tongue short. Abdomen oblanceolate, not extending quite so far as the hind wings. Legs moderately stout; hind tibiæ with two minute apical spurs. Wings moderately broad, not long. Fore wings slightly convex in front; the hind angle somewhat rounded; first and second inferior veins almost contiguous at the base; third about eight times nearer to the second than to the fourth.

1. **H. fucosa** *Hübner*. Exot. Schmett. 21, 236, f. 471–2.

Rose-colored. Abdomen with a broad dorsal gray band. Wings gray. Fore wings with the borders and a furcate stripe, rose-colored. Hind wings with the basal half rose-colored.

Georgia.

WALKER.

LYMIRE WALKER.

Female. Body stout, elongate-fusiform. Head large. Palpi stout, slightly curved, a little shorter than the head; third joint conical, very small, not one-fourth of the length of the second. Tongue of moderate length. Antennæ setaceous, moderately pectinated, rather more than half the length of the body. Abdomen extending for nearly half its length beyond the hind wings. Legs slender, rather long; hind tibiæ with four minute spurs. Wings very narrow, somewhat pointed. Fore wings straight in front for two-thirds of the length, conical towards the tips, very oblique along the apical border, very obtusely angular behind; first and second inferior veins united for a short space from the base; third very near the second; fourth remote from the third.

1. **L. melanocephala** *Walker*, 490.

Hoary. Head, antennæ, and palpi black. Head, palpi, and fore coxæ thickly clothed beneath with pale luteous hairs. Prothorax clothed with pale luteous hairs. Abdomen blackish, pale luteous beneath. Anterior legs brown, with testaceous femora;

hind legs testaceous. Fore wings with testaceous fore borders. Hind wings limpid, with hoary fore borders and tips.

Jamaica.

WALKER.

PERCOTE WALKER.

Male. Body rather thick and long. Palpi curved, ascending, as long as the head; third joint slender, linear, not more than one-fourth of the length of the second. Tongue short. Antennæ minutely pectinated. Abdomen extending for nearly half its length beyond the hind wings. Legs rather stout (mutilated in the specimens described), with four? spurs of moderate length. Wings narrow, not long. Fore wings straight in front, conical towards the tips, rounded and not angular behind; first and second inferior veins contiguous at the base, third about thrice further from the fourth than from the second.

1. **P. signatura** *Walker*, 493.

Brown. Head with a luteous spot on each side behind the vertex. Palpi luteous beneath towards the base. Thorax with a luteous spot on each side. Abdomen luteous above, pale testaceous beneath. Coxæ luteous. Fore wings with a short oblique limpid streak near the fore border and before the middle of the length. Hind wings grayish hyaline with broad brown borders.

West Indies.

WALKER.

LITHOSIA FABR.

Fore wings rather elongated, subelliptico-truncate. Disk rather narrow, closed by a very faint vein. Subcostal vein *remote from the costa*, with two marginal nervules from near the middle of the disk rather erected, and another exterior to the disk, between it and the furcate apical nervule. The subcosto-inferior and discal from a short common stalk. Median 4-branched, the posterior remote from the others, arising interiorly to the first marginal nervule. Hind wings much broader than the fore wings; with

the costal and subcostal veins from a common stalk, the latter bifid beyond the disk, which is closed by a faint vein. Median vein 3-branched, the two superior on a common stalk, which becomes bifid opposite the fork of the subcostal.

Head rather small, free, smooth; without ocelli. Face moderate, flat, smooth. Eyes moderate, prominent. Antennæ simple, setose in both sexes? Palpi moderate, recurved, but little exceeding the clypeus, squamose; the basal joint tumid, and about equal to the middle joint, which is cylindric; the terminal joint slender and nearly equal to the middle joint. Tongue slightly more than one-half as long as the thorax beneath.

Body moderately thick, rather less than the length of the hind wings. Patagia small, nearly cylindrical. Abdomen beneath one-half the length of the body. Legs rather stout; fore tibiæ with a short spur at the base; hind tibiæ with four moderate spurs.

1. **L. miniata** *Kirby*. Faun. Bor. Am. IV, 305, 1. *Gnopria vittata* Harris, Ins. Mass. 2d ed. 262. *Atolmis? miniata* Clemens, Proc. Acad. Nat. Sci., Nov. 1860, 543.

Scarlet or yellow tinged with scarlet. Antennæ black. Palpi tipped with black. Fore wings with three broad slate-colored or lead-colored stripes, the first near the costa; the third near inner margin; the second short in the middle of the wing posteriorly. Hind wings blackish slate-colored, scarlet or pinkish at the base. Abdomen black with a broad scarlet stripe beneath.

CLEMENS.

2. **L. longipennis** *Walker*, 510.

Yellow. Palpi brownish towards the tips. Tibiæ and tarsi brownish. Fore wings long, narrow, conical at the tips, with a very long narrow brown border which is slightly widened at the tips, and does not extend further than the tips of the hind wings towards the base behind. Hind wings with a brown fringe at the tips.

Mexico.

WALKER.

EUSTIXIA HÜBNER. See p. 252.

EUBAPHE Hübner. See p. 253.

The following genus is one of a group that appears to connect the *Lithosiidae* with the *Tineina*. It probably differs from the *Lithosiidae* in structure, and cannot be regarded as a member of the family.

MIEZA Walker. See p. 253.

2. **M. subfervens** *Walker*, 528. See p. 253.

3. **M.? pupula** *Hübner*. *Eustixis pupula* Hübn., Samml. Exot. Schmett. III, 24, 245, f. 489, 490. See p. 254.

Fam. VII. HYPSIDAE.

In the structure of the palpi, this family much resembles some of the groups of the *Noctuites quadrifidae* of Guenée.

PITANE Walker. See p. 254.

1. **P.? mediastina** *Hübner*. *Dysauxes mediastina* Hübner, Samml. Exot. Schmett. III, 27, 253, f. 505-6. See p. 254.

Male. Black. Disk of the thorax and abdomen at the tip luteous. Fore wings with a postmedian clavate band and seven bands, white. Hind wings luteous, bordered with black, and with a black band.

Georgia.

Walker.

Fam. ———————?

CROCOTA Hübner.

Fore wings rather broad, trigonate. The subcostal vein almost above posterior end of the disk, gives rise to a single marginal nervule, and the apical branch is trifid at the tip; and sometimes with a second short marginal branch from about the middle of the apical nervule. The subcosto-inferior and the discal arise on a short common stalk, the latter vein angulated. The median is 4-branched, with the posterior remote from the others. Hind

wings rounded, broader than the fore wings, with the costal and subcostal veins from a common stalk, the former simple and the latter bifid, with an angulated discal vein from the point of bifurcation. Median *with three branches*, the posterior remote.

Head moderate, free, smooth; ocelli small. Face moderate, flat, smooth. Eyes rather large, prominent. Antennæ not more than half as long as the body, rather stout, setaceous and slightly setose. Palpi rather slender, porrected, exceeding the clypeus by at least one-half their length, and pubescent; the terminal joint pointed and slender, about one-half as long as the middle joint. Tongue slender, about one-half as long as the anterior coxæ, or rudimentary.

Body smooth, rather slender; length less than that of the hind wings. Patagia scale-like. Abdomen smooth, beneath one-half as long as the body. Legs rather slender; fore tibiæ with a short, concealed, middle spur; hind tibiæ with four short spurs.

Closely allied to the *Arctiidæ*.

TABLE OF SPECIES.

Wings with a discal dot.	
Abdomen ferruginous, with dorsal and black dots.	**ferruginosa.**
Abdomen rose color.	**brevicornis.**
Abdomen reddish-brown or fulvous.	**rubicundaria.**
Wings without discal dot.	
Abdomen red, with a black stripe.	**laeta.**
Abdomen testaceous; wings subhyaline.	**cupraria.**

1. **C. rubicundaria** *Hübner*. Samml. Ex. Sch. III, 28, 256, f. 511, 5, 12. *Arctia rubricosa* Harris, Ins. Mass. 2d ed. 274. See p. 256.

Fulvous or reddish-brown. Antennæ fulvous, blackish on the sides. Fore wing sometimes with a brown discal spot. Hind wings more or less red, with a more or less distinct marginal black band, sometimes absent, and sometimes with a dark brown discal dot. Fore wings with a second marginal nervule on the middle of the apical.

Pennsylvania.

CLEMENS.

Variety? Yellowish. Fore wings without discal dot. Hind

wings with a discal dot and rather broad, distinct dark brown marginal band.

Pennsylvania.

CLEMENS.

2. **C. brevicornis** *Walker*, 536. See p. 255.

Fawn color or luteous fawn color. Antennæ black, short. Abdomen rose color. Fore wings rosy beneath. Hind wings rose color, with an indistinct and sometimes quite obsolete brown stripe in the hind border, and a brown dot in the disk. Body $2\frac{1}{2}$—$3\frac{1}{2}$ lines long; wings 8—10 lines.

WALKER.

I have specimens which correspond very nearly to the above description. The anterior portion of the body is luteous, as are the fore wings, but combined with a reddish hue. Hind wings cinnabar red, without marginal band or discal spot, and in one specimen the terminal joint of the palpi is blackish.

Illinois, Mr. Kennicott.

CLEMENS.

3. **C. ferruginosa** *Walker*, 535. See p. 255.

Ferruginous. Abdomen pale ferruginous, with a row of dorsal black dots. Hind wings pale ferruginous, with a blackish dot in the disk, and two or three blackish spots along the border. Length of the body $3\frac{1}{2}$—4 lines; of the wings 10—11 lines.

Hudson's Bay.

WALKER.

It is possible this insect may be the *rubricosa* of Harris. I have specimens which agree in general with Mr. Walker's description, but they possess noticeable differences in structure as compared with the others described previously. In these the *tongue is rudimentary; fore wings with a second marginal branch in the middle of the apical nervule.* In every other particular the structure conforms to that of the genus. These differences may be sexual. In ornamentation they are reddish-brown, scarcely ferruginous, and in addition to the discal dot, have a rather faint dark brownish band crossing the nervules. Hind wings rather paler than the fore wings, one specimen with a blackish discal spot, the other without it, and faint blackish spots along the margin near the inner angle.

My own impression is that *rubicundaria* of Hübner and *rubricosa* of Harris is a variable insect, and that *ferruginosa* of Walker, and perhaps *brevicornis*, are not true species. I am much more uncertain, however, respecting the latter than the former.

4. C. cupraria *Walker*, 536.

Testaceous. Fore legs mostly brown. Wings slightly rosy testaceous, subhyaline, with a slight cupreous tinge towards the tips. Length of the body 3—4 lines; of the wings 9—11 lines.

Jamaica? S. America.

WALKER.

5. C. laeta. *Lithosia laeta* Boisd. Guer. Icon. Règ. An. Ins. pl. 88, f. 6, p. 519. *C. laeta* Walker, 537.

Grayish-black. Tongue testaceous. Abdomen red, with a black stripe which is broader beneath than above. Fore wings red along the costa. Hind wings red, with a broad grayish-black border. Length of the body 3 lines; of wings 9 lines.

N. America?

WALKER.

CISTHRENE WALKER. See p. 254.

FAM. ———— ?

TRICHROMIA HÜBNER.

Body slender, rather long. Palpi short. Antennæ setaceous, simple, slender. Abdomen exceeding the hind wings by one-third. Feet slender, hind tibiæ with four long spurs. Wings rather narrow, scarcely elongated. Fore wings slightly convex along the costa, somewhat oblique along the apical border, posterior angle rounded.

1. T. trigemmis *Hübner*. Exot. Schmett. III, 22, 239, f. 477, 478.

Dark brown. Fore wings with a yellow median band, and a spot of the same hue at the tips. Hind wings white, the hind margin and more than one-third of the tip gray.

St. Domingo.

WALKER.

FAM. ————————?

CINCIA WALKER.

Female. Body short, stout, linear. Palpi straight, much shorter than the head; third joint linear, conical at the tip, much shorter than the second. Antennæ slender, serrated, pubescent, a little more than half the length of the body. Abdomen not extending beyond the hind wings. Legs slender; hind tibiæ with four moderately long spurs. Wings rather broad, not long. Fore wings slightly convex in front, oblique along the apical border, angular behind; first, second and third inferior veins approximate at the base; fourth remote from the third.

1. **C. conspersa** *Walker*, 539.

Whitish or hoary. Palpi blackish towards their tips. Thorax with black dots. Anterior tibiæ with black bands. Fore wings sprinkled with black points and with full twenty-four black dots, of which there is a row across each tip; under side and hind wings blackish.

Jamaica.

WALKER.

FAM. ————————?

ERITHALES POEY.

Tongue distinct. Palpi cylindrical, produced beyond the head, with the third joint oriform. Antennæ of the males strongly pectinated. Wings exceeding the abdomen.

1. **E. guacolda** *Poey*. Cent. Lép. Cuba.

Wings brown; fore wings partly paler, with many black dots. Abdomen yellow. Body and feet dotted with black.

Cuba.

POEY.

FAM. ————————?

Wings with tineæform structure. Hind wings with the costal nervure straight; with the subcostal *simple, attenuated interiorly to the discal, but joining the costal near its basal third.* Discal vein nearly straight, *with two disco-central nervules.* Median with three equidistant branches.

Fore wings with the disk extending beyond the apical third of the wing. About the middle of the disk the subcostal vein sends off a strong marginal branch, beyond which is a secondary cell, from the hinder end of which arise two marginal and an apical branch; discal vein nearly straight, with three disco-central branches; median 3-branched, the posterior very remote from its penultimate; the fold is thickened and the subcostal is forked at its base.

PŒCILOPTERA CLEMENS.

The wings are longer than the body. The anterior rather narrow, enveloping the body when folded; apex obtusely rounded and hind margin slightly oblique. The subcostal nervule gives rise to a marginal nervule, about its middle, and within the disk forms a large secondary cell, from the hind end of which arise three distinct marginal nervules, the lower one reaching the costa rather above the tip. The disk extends rather beyond the apical third of the wing, and the discal vein gives rise to three nervules. The median is 3-branched, the posterior branch being remote from the others and arising opposite the origin of the subcostal branch, which forms the secondary cell. The fold is thickened, and the submedian furcate at its base. The hind wings are rather broader than the fore wings; obliquely rounded along the hind margin from the tip to the base; costa nearly straight. The costal nervure distinct and simple; the subcostal simple and rather attenuated from the discal vein towards the base. The discal vein gives rise to two nervules, and sends a false nervule through the disk towards the base of the wing. The median subdivides into three equidistant nervules.

Head rather small, smooth, free; without ocelli. Face rather

narrow, tapering, vertical. Eyes small, salient. Antennæ slender, with joints closely set, *serrated beneath with scales.* Palpi slender cylindrical, curved, ascending rather above the middle of the front; basal joint squamose; middle and terminal joints smooth and equal in length. Tongue about one-half as long as the body.

Body slender, scarcely equal in length to the fore wings. Patagia scale-like. Abdomen slender, more than one-half as long as the body beneath. Legs smooth and slender; fore tibiæ with a long, concealed internal spur; hind tibiæ with a pair of apical spurs.

The wing structure of the insect included in this genus resembles most strikingly that of the *Tineina*, and must form a group connecting the *Lithosides* directly with it.

1. **P. compta** *Clemens.*

Palpi pale yellow, with the ends of the second and third joints black. Head yellow, with a black spot between the antennæ and a black band across the face. Thorax reddish orange, with two black spots in front; neck yellow, edged behind with blackish. Fore wings reddish orange, with four bluish-black patches placed transversely on the wing and containing yellow spots; the first at the base; the second interior to the middle of the wing; the third exterior to the middle, constricted toward the costa and connected behind with the subterminal patch, which is constricted in the middle. The hind wings are slightly hyaline; dark brown.

Texas. Capt. Pope's Coll. From the Smithsonian Institution.

CLEMENS.

FAM. ARCTIADAE.

Group **Callimorphides.**

Body slender, smooth or nearly smooth, much shorter than the wings, either when folded or extended. Head small, smooth, with ocelli. Fore wings elongate-trigonate; hind wings slightly diaphanous, ample, length equal to that of the body, folded when at rest.

Hind wings neuration arctiæform; costal and subcostal veins with a common origin near the middle of the disk;

subcostal bifid usually beyond the origin of the discal vein, sometimes from the origin of it; discal vein simple angulated. Median 4-branched, with the three upper branches more or less aggregated, and the fourth very remote from them. *Fore wings with a secondary cell* in the subcostal system.

DEIOPEIA Steph.

Fore wings elongate-trigonate, length exceeding that of the body by at least one-third; subcostal vein with a narrow cell above the discal vein, with a single marginal branch arising interiorly to it and one from its hinder apex; the subcostal vein continues towards the tip of the wing from the apex of the subcostal cell subdividing into post-apical and apical branches, the latter furcate. Discal vein, simple, angulated. Median 4-branched, the posterior very remote from the other branches.

In the hind wings the subcostal vein is bifid from the origin of the discal.

Head small, smooth, with ocelli. Eyes prominent. Antennæ simple in each sex, rather short and slightly pilose beneath in the males. Palpi curved, ascending nearly to the middle of the face, squamose, basal joint tumid, middle joint long, terminal joint short, ovate. Tongue about equal to the thorax beneath.

1. **D. bella** *Linn.* Syst. Nat. I, 2, 884, 348, 399. *Tinea bella* Drury, I, 51, pl. 24, f. 3.

Palpi white, with black tips. Head and thorax white, spotted with black. Thorax with an orange-yellow spot on each side in front. Fore wings orange-yellow, with five or six white bands, spotted in the middle with black, the last one furcate towards the costa and the hind border spotted with black. Hind wings bright red, with the hind margin bordered with a black, white-bordered, indented band, which is furcate at the tip of the wing. The under side of the wings is red; along the costa of the fore wings are three equidistant black spots, an angulated black band, sometimes interrupted, near the hinder margin, and a row of marginal black spots; along the costa of the hind wings, beginning on the middle,

are two white-bordered black spots, and a furcate, white-bordered black band on the margin similar to that on the upper surface.

Illinois, Texas (from Smithsonian Collection, Capt. Pope), Florida, Nova Scotia.

CLEMENS.

2. **D. speciosa** *Walker*, 569.

White. Head and thorax with black spots. Thorax with a red spot on each shoulder. Fore wings with alternate black and *red* bands, the former macular, the latter angular and very variable as to breadth; under side deep red, with a few black spots. Hind wings red; with two or three variable black white-bordered spots in front and with a black border.

West Indies.

WALKER.

SUPPLEMENT.

While the present compilation of the published North American Lepidoptera has been passing through the press, additional species have been announced by authors, and others have been detected that had been previously overlooked; some important rectifications of synonymy have also been found necessary. With the view, therefore, of making the work as complete as I can, to the end of the year 1861, I propose to combine in a Supplement everything I can find bearing on the subject, not already presented in the preceding pages. This will include some species belonging to families elaborated by Dr. Clemens, and which he has omitted from their not having come under his observation, or from his not being satisfied with their exact position in the system. J. G. M.

FAM. II. PIERIDAE, p. 15.

By S. H. SCUDDER (*in Proc. Boston Soc. Nat. Hist.* VIII, 1861, 178).

PIERIS SCHR., p. 16.

P. oleracea *Boisd.* (p. 19 of the present work). *Pontia casta* Kirby, F. Bor. Am. IV, 288, pl. 3, fig. 1 (p. 19). *Pontia oleracea* Harris, N. Eng. Farmer, VIII, 402, Ibid. Ins. Inj. Veg., 1st ed. 213; 2d ed. 233, Ibid. Agass. L. Sup. 386, pl. 7, fig. 1. *Pieris cruciferarum* Boisd. Spec. Gen. 519.

The butterflies described by Harris, Boisduval, and Kirby, under the above-mentioned names, are one and the same insect. It is found inhabiting the northern and eastern portions of North America, reaching south but rarely as far as Pennsylvania, and extending to the east to Nova Scotia, west at least as far as Lake Superior, while to the North it is found up to Great Slave Lake, in the Hudson's Bay Company's Territory, and even according to Kirby, to lat. 65° N. on McKenzie River.

I have examined many specimens obtained by Mr. R. Kennicott at different points in British America, from Lake Winnipeg to the Great Slave Lake, and by Mr. Drexler upon the southeastern

shore of Hudson's Bay, all of which were kindly placed in my hands for examination by W. H. Edwards, Esq., of Newburgh, N. Y. I have also had before me in my comparisons specimens in the Museum of Comparative Zoology at Cambridge, from various points in the northern United States, among which are those collected by Professor Agassiz, on the north shore of Lake Superior; besides these, I have availed myself of my opportunities of studying the specimens contained in the cabinet of the late Dr. Harris, now in possession of this Society, and have, in addition, compared with them specimens in my own collection, obtained in various portions of the New England States.

I have never seen a perfectly white specimen of this insect; the most immaculate ones I have examined had a few gray scales scattered about the base of the primaries and along the basal half of the costal border, while beneath, the whole surface of the secondaries was bathed with a scarcely perceptible tint of a pale-yellowish color; from this limit every possible intermediate variation may be found, in males and females equally, till it comes to have an upper surface with obsolete spots similarly situated to those on the upper surface of *P. Rapæ* of Europe, and the line along the costal border extending sometimes, with much distinctness, beyond the tip, nearly half way down the outer border; the upper surface is also sometimes faintly tinged with pale-greenish yellow, the extremities of their nervules tipped with black, and the grayish scales of the base extended into the secondaries; but upon the under surface are found the widest limit of variation, for not only may the tips of the primaries become distinctly greenish or lemon-yellow, and the nervules at the apical portion, together with the medial nervure, be somewhat heavily bordered with grayish scales, but also the whole surface of the secondaries may have its ground color distinctly greenish or lemon-yellow, and all the nervures, from origin to tip, very broadly and thickly bordered with grayish scales, while a slender line of grayish scales—the continuation of the third superior nervule—crosses the cell longitudinally; the costal border also at base is colored with orange, and the inner border at base with grayish scales; at the same time specimens are found with the under surface of the secondaries having broadly bordered nervures combined with a basal color of nearly pure white.

No possible step in the gradation from one extreme to the other is wanting, and both extremes are found equally among numerous

examples from as widely distant places as Massachusetts and the Great Slave Lake, though the suite of specimens with which I have made my comparisons would seem to indicate that the paler forms are more commonly met with in the more southern localities, and the more heavily marked ones are the characteristic forms of the north. It may be noticed in this connection that Kirby, by a comparison between a single specimen from Massachusetts with three from lat. 65° N., separated the northern from the southern as being *less* heavily marked.

SCUDDER.

P. protodice *Boisd.* (p. 17). Scudder, Pr. Boston N. H. Soc. VIII, 1861, 180.

An examination of a large number of specimens in the collection of the late Dr. Harris, in that of the Museum of Comparative Zoology, and in my own, has shown me that this butterfly also enjoys a wide geographical range, extending from Texas on the southwest, Missouri on the west, and the mouth of the Red River of the North on the northwest, as far as Connecticut, and the southern Atlantic States on the east.

Coincident with these widely separated geographical limits is its wide range of variation, especially to be noticed on the under surface of the secondaries, wherein it corresponds remarkably with *P. oleracea*. On the one hand, we have secondaries which are immaculate, save some scarcely perceptible yellow scales on the discal nervule, bordered by a very few scattered gray scales, a cluster of a few distant gray scales near the border, between the first and second superior nervules, and a dozen or so, more widely separated, similarly situated between the second and third, and the edge of the wing light greenish-gray, with the fringe white. On the other hand, we find greenish-gray scales spread quite heavily along the borders of all the nervures, with the exception of the basal half of the superior and first inferior nervules, which being clustered together toward the border into arrow-head spots, and uniting together at their widest portion, form a transverse zigzag bar; in the place of the few grayish scales, between the first and second superior nervules, we have a large spot of greenish-gray extending across the first superior nervule to the border; a few scales only border the anterior half of the third superior and first inferior nervules, and the yellow scales of the discal nervule are

only slightly increased in number, though the scales which border it make a large spot, and are generally deficient in the greenish tinge; the narrow border is interrupted by the darker scales which form the swollen tips of the arrow-head spots.

These extremes of variation I have found most generally in the male; in the other sex, I have not seen any specimens which had these wings so nearly immaculate as that first mentioned, the nearest approach to it being in specimens which discover a few scattered scales along the borders of the nervures, the cross-bar of arrow-head spots, reduced to an indefinite indistinct zigzag band, and the central spot of yellow, bordered with gray scales quite indistinct.

It may also be said of this species, as of *P. oleracea*, that these differences are observable equally in any locality in which the insect may be found, and the gradation is complete, though I have not as yet seen any heavily marked males from the extreme western limit of their range, but all I have examined have been nearly immaculate.

P. protodice is the American representative of the European *daplidice*, the Alpine *callidice*, the Siberian *leucodice*, the South American *autodice*, the Arabian *glauconome*, and the South African *hellica*. We have in temperate North America no representative of the European *P. chlorodice*.

In eastern Labrador there is a white butterfly, very closely allied to, but yet distinct from *P. oleracea*. It was considered by Boisduval to be the same (see Spec. Gen. I, 518). Four specimens were obtained by an expedition sent out in the summer of 1860, by the Lyceum of Natural History in Williams College, to Labrador and Greenland; they were collected by Mr. A. S. Packard, Jr., on Caribou Island, Straits of Belle Isle, and have been sent me for examination with numerous other insects —it may be called

SCUDDER.

8. P. frigida *Scudder*. Proc. Bost. Soc. N. H. VIII, Sept. 1861, 181.

Two of the specimens obtained were males and two females; the shape of the secondaries of the male of *frigida* is as in the female of *oleracea*, those of *frigida* being proportionally narrower across the hind margin, and broader across a line parallel to it, near the base of wing, than in the same sex in *oleracea;* or in other words, the secondaries of *frigida* are relatively more quad-

rate, and those of *oleracea* more triangular; the outer half of the costal border of the secondaries is slightly more docked in *frigida* than in *oleracea;* the dark narrow line which follows the costal border of the primaries extends around over rather more than half the outer border of the wing, while in *oleracea* it seldom extends beyond the tip, and very rarely half way round the outer border; the nervures on the under surface are more heavily marked than in the darkest individuals of *oleracea*, though the markings are in the same locality, such as the outer and uppermost nervules of the primaries, the median nervure, the nervures of the secondaries, except the discal, the inner margin next the base, and a band crossing the cell, which is the extension of the third superior nervule; the markings of the primaries are heaviest towards the outer border, those of the secondaries away from it; the costal border of the secondaries at base is slightly tinged with saffron; the color of the under surface of the wings is slightly dirty white, tinted with very pale greenish-yellow, especially noticeable on secondaries and upper half of primaries; when any color is present on the primaries of *oleracea* it is confined to the tip; it differs further from *oleracea* in having the black scales at base of both wings above more profuse and widely spread, frequently bordering the nervures quite broadly; indeed grayish scales are more or less scattered over the whole of the upper surface, giving the insect a grim appearance, increased rather than diminished by the slightest possible yellowish tint.

By this description it would be exceedingly difficult to distinguish this species otherwise than by immediate comparison with both sexes of *oleracea;* the differences are more easily to be seen than described, though the extreme limits of variation of *oleracea* do by no means permit us to include within its boundaries this comparatively persistent form; it is more heavily marked than the extreme of *oleracea.*

Eastern Labrador.

SCUDDER.

In order the better to compare together some of our species of *Pieris,* I introduce here descriptions of some new species of this genus from our western coast.

9. P. venosa *Scudder.* Pr. Bost. Soc. N. H. VIII, Sept. 1861, 181.

Above, white tinted with very pale greenish-yellow; base of all the wings black, and costal border of primaries with a black band, extending about half its length; extremities of upper nervules of primaries broadly margined with black scales, with a spot of the same color in the middle of the space between first and second inferior nervules; a black dot at the tips of the nervules of secondaries. The female differs from the male in having nearly all the nervures on upper side of primaries somewhat bordered with grayish scales, and the extremities of the lower nervules almost equally with the upper; but most characteristically by the presence of a band of grayish scales along the posterior border of primaries, which is bent abruptly upwards in the direction of the spot in the space between first and second inferior nervules, and continues to third inferior nervule, sometimes interrupted at the angle.

Beneath, as in the darker forms of *P. oleracea*, with the ground color slightly more highly colored than the upper surface, the nervures of the secondaries being heavily, and those of the primaries more narrowly bordered with grayish scales, with a saffron-colored spot at base of costa of secondaries.

Antennæ black, with incomplete white annulations interrupted above; tip of club yellowish; body black, with whitish hairs beneath; the wings expand from 1.75 to 2 inches.

I have examined twenty specimens (5 ♀, 15 ♂), brought to the Museum of Comparative Zoology by Mr. Alexis Agassiz, from San Mateo and Mendocino City, California.

[Doubleday in his Gen. Diurn. Lep. states that *P. callidice* Godt. is found among the Rocky Mountains; Boisduval, in his Lep. de la Californie, enumerates *P. leucodice* Eversmann among them, remarking that his specimens "do not differ from individuals from Altaï;" and lastly, Ménétriés, in his St. Petersburg Catalogue, gives *P. autodice* Hübn. as an inhabitant of California. Since no description has been given in any of these cases, and the insects themselves are so closely allied, one can scarcely doubt that these entomologists had before them specimens of the same Californian species. Among the large number of species from the Pacific coast, which I have examined, I have never seen anything approaching near enough to either of these to warrant the positive assertion that it was the species referred to by them. *P. venosa* is the most nearly allied for which I cannot but think they have mistaken it, sad as the blunder may be. *P. callidice*, *leucodice*, and *autodice* are represented by *P. protodice*, belonging to an entirely different section of the genus from *P. venosa.*]

SCUDDER.

10. **P. marginalis** *Scudder*. Pr. Bost. Soc. N. H. VIII, Sept. 1861, 183.

This species is most closely allied to the preceding *P. venosa*. The ground color is as in *venosa*, but almost devoid of markings; base of all the wings black; costal border of primaries with a narrow black band, extending about half its length; a few grayish scales at the tip of wings; outer edge of primaries, and posterior edge of secondaries with a very fine black line, slightly swollen at the tips of the nervures; fringe white; beneath as in *P. venosa*, with the secondaries and apex of primaries more yellowish; males and females alike in their markings.

Body black, with some white hairs above, and a considerable number of yellowish white ones beneath; antennæ as in *P. venosa*. The wings expand two inches.

I have seen only two specimens (1 ♀, 1 ♂) which are in the Museum of Comparative Zoology. The female came from the Gulf of Georgia, and the male from Crescent City, California. They were obtained by Mr. Agassiz.

SCUDDER.

11. **P. pallida** *Scudder*. Pr. Bost. Soc. N. H. VIII, Sept. 1861, 183.

Above, very pale-yellowish, nearly white; base of both wings and basal half of costal border of primaries dotted with grayish scales; whole costal edge of primaries black; the male has, in addition, a band of grayish scales on the posterior border of primaries as in the male of *P. venosa*, turned abruptly towards, and sometimes interrupted at the angle, extending to the third inferior nervule; and in the middle of the space between the first and second inferior nervules, as in both sexes of *P. venosa*, a cluster of grayish scales.

Beneath, secondaries and apex of primaries yellowish, with sometimes a few indistinct grayish scales scattered along the nervures, otherwise quite immaculate.

Body, above black, with scattered yellowish hairs; beneath yellow; antennæ as in *P. venosa*. The wings expand two inches.

This species was obtained by Mr. Alex. Agassiz, at the Gulf of Georgia. I have had before me five specimens (3 ♀, 2 ♂), which are in the Museum of Comparative Zoology.

SCUDDER.

12. **P. tau** *Scudder*. Pr. Bost. Soc. N. H. VIII, Sept. 1861, 183.

Above, pure white; costal border of primaries with a broad black band, suddenly bending downwards and outwards, and following the discal nervule to its uttermost extremity, forming, with the black body, an elegantly formed T; this band has a white streak in it at the base; beyond the costal band, and connected with it by the black edge of the costal border, is a large apical spot, the inner edge of which runs parallel to the outer edge of the extension of the costal band, till it reaches the first inferior nervule, when it curves towards the base a short way, and again extending downwards, with an incurved border, reaches the second inferior nervule, where it is rather abruptly broken; this spot has three or four, sometimes five white, unequal, oval, sometimes round spots, the largest nearest the apex; some blackish scales follow the principal nervures of the secondaries for a short distance, and the tips of the nervures are sometimes black, otherwise there are no markings on the secondaries of the male, except the dusky reflection of the markings of the lower surface, which the transparency of the wing allows; the female, however, repeats slightly at the outer angle the markings of the lower surface.

Beneath, pure white; the markings of the upper surface of the primaries are repeated, with the white spots and streaks slightly enlarged and increased; the nervures of the secondaries are all narrowly bordered with blackish scales, which expand at the tips; commencing at the termination of the first superior nervule, a submarginal narrow band approximately follows the curve of the margin, is bent at the third superior nervule, and extends to the inner angle.

Labial palpi with mingled black and white hairs; antennæ black, with white scales scattered irregularly over the sides and under surface, as far as the club. Body black, with whitish hairs, especially below. The wings expand two inches.

It represents in Washington Territory the *P. sisimbrii* Boisd. of California. A large number of specimens are in the Museum of Comparative Zoology, obtained by Mr. A. Agassiz at the Gulf of Georgia.

The distinction I have made between males and females in the foregoing descriptions, is founded upon characters which I first noticed by comparing together the two sexes of *P. protodice*, a species whose sexes have been known for a long time, and which

are easily distinguished by their markings. On placing together, side by side, series of males and females of this species, it was discovered that there was a sexual distinction in the *cut* of the hind margin of the secondaries; it consists in the female having the outer angle more prominent, and so the whole hind margin less regularly curved, or, as it might be expressed, more flattened—these differences, though slight and requiring a careful examination, hold persistently in all species of *Pieris* I have examined. I have in several cases tested it carefully, by separating, upon this characteristic, the specimens of those species which exhibit two classes of individuals with distinct markings, and have in all cases found the markings to be coincident unequivocally with the cut of the wing. It will be seen, however, that in all the species it does not hold, as in *P. protodice*, that the female is the darkest.

Two of the species I have described from Western America, *P. venosa* and *P. pallida*, represent respectively the *P. napi* and *P. rapæ* of Europe. It will be noticed in the European species that each has the same plan of ornamentation upon the upper surface of primaries, namely, a large apical and small submarginal central spot, and that the peculiar distinction between the two is found in the presence or absence of the dark scales bordering the nervures of the secondaries. Just so is it in the Western American species, separated most characteristically from one another by the same distinction in the under surface of the secondaries, and linked together in the same way by certain characters of ornamentation (which, however, are not borrowed from its European congeners), that is, by the presence in the males of the bent band of the inner margin of primaries, and a small submarginal central spot. But when we turn to Eastern America we find this striking circumstance, that *P. oleracea*, within its own wide range of variation represents both *P. rapæ* and *napi* of Europe, and both, *P. pallida* and *venosa* of the Pacific coast;—and what do we discover here, but that, discarding the strict lines of demarcation which separate alike *P. rapæ* and *napi* and *P. pallida* and *venosa*, it follows instead, with remarkable similarity, the range of variation discoverable in *P. protodice*, as before described, a species much farther removed from it in the genus than are they, thus simulating rather its *geographical neighbor* than its *nearest congeners*.

P. frigida and *P. marginalis* appear to have no true representatives.

SCUDDER.

Fam. V. NYMPHALIDAE, p. 40.

By W. H. Edwards (*in Pr. Acad. Nat. Sci. Philad.* 1861).

MELITÆA Fab. p. 50.

7. **M. mylitta** *Edwards.*

Male. Upper side fulvous; fringe of primaries alternately black and white, of secondaries white; on hind margin of primaries a broad black border, in which is a series of fulvous lunules, the middle one largest and projecting, preceded by a sinuous row of round fulvous spots which increase in size towards the inner margin; next, a fulvous band, the upper half of which intersects the preceding row at the fifth spot, making it appear bifid on the costal margin; this band is edged anteriorly by a black line which is dilated on costal and on inner margin; on the distal arc a fulvous streak entirely edged with black; base of both wings covered by wavy confluent black lines, as in Tharos.

Secondaries have a narrow black marginal border, on the anterior edge of which is a row of fulvous lunules, the one next the anal angle bisected longitudinally by a black line; above these a row of black dots, the one in the anal angle oblong; on the costal margin near the outer angle a black patch, from which an interrupted dark line crosses the wing to near the abdominal margin.

Under side: primaries pale fulvous, clouded with yellowish on the apex and hind margin; the black markings on the disk of upper side indicated below from the transparency of the wing; a black patch near the inner angle, a faint black streak on costal margin, and another on inner margin corresponding with the dilated extremities of the line above; both wings bordered by lunules.

Secondaries yellowish, clouded with brown on the disk and on the hind margin; the middle lunule white and arrow-shaped, those next the angles yellowish, the others dark brown; a row of brown points corresponding with the spots above; across the middle of the wing an irregular band of yellowish white edged with ferruginous; next the base several white or yellow-white spots edged with ferruginous.

Female. One third larger than the male, which it resembles; the marginal spots and transverse band on primaries are of lighter

color, the latter tawny; the marginal lunules on secondaries are tawny; beneath, the lunules next the inner angles of secondaries are silver white, as are the band and the spots next the base; near the apex of primaries are four or five small silver spots. Expands 1.2 inch.

Texas, Kansas, California.

This species appears to vary widely in color. Individuals are found blackish instead of fulvous, the wavy lines near the base lost in the uniform shade. The marginal spots and band are light colored, nearly yellow, but disposed as in the type above described; the under side exhibits little variation.

EDWARDS.

8. **M. minuta** *Edwards.* Pr. Acad. Nat. Sci. Philad. 1861.

Upper side orange fulvous; a narrow black border upon the hind margin of both wings, within which is a series of fulvous lunules; preceding the black border a narrow common fulvous band edged anteriorly with black, and inclosing on costal margin of primaries a transverse row of four obsolete white spots; from this band to the base both wings are marked by transverse, undulated black lines; base clouded with brown; costa of primaries brown; fringe white, cut with black at the intersection of the nervures.

Under side orange, brighter on secondaries; a narrow white border on the hind margin of both wings; anterior to this a series of white lunules, each edged with black; on costal margin of primaries a transverse row of four white spots; beyond this to the base black markings as on upper side; on secondaries the lunules are preceded by an immaculate orange band, beyond which is a broad transverse white band, containing three rows of black spots, somewhat irregularly placed, and mostly oblong; some of the middle row circular; another irregular white band crosses the wing towards the base, edged with black spots; at the base a white spot edged with black. Expands 1.4 inch.

Texas.

EDWARDS.

9. **M. nycteis** *Doubleday.* Figured in Doubl. & Hewitson, pl. 23.

Male.—Upper side tawny; fringe long, with alternate bars of black and white; primaries next the base crossed by black undulated lines edged without by a zigzag black band which is dilated on the costal and on the inner margin; a broad black border on

hind margin and apex, within which, along the margin is an interrupted series of points, the middle one lunular, the two next the apex white, the others tawny; preceding these a transverse sinuous row of small spots, nearly round, tawny, except the two on the costal margin, which are white and minute; between the black border and the zigzag band a broad sinuous tawny band common to both wings.

Secondaries next the base greenish-black, lightly sprinkled with tawny atoms, and marked by two or three patches of same color, the outline less irregular than on primaries; on hind margin a narrow black border, which extends also along the costal margin to the common tawny band; from its anterior edge on the costa, a wavy black line crosses the disk and terminates inside the abdominal margin; upon the hind margin a series of yellow lunules, the third from the anal angle largest and projected; above these a broad tawny band, edged anteriorly by the wavy black line, incloses a row of six black spots, the middle one largest, the one in the anal angle long; abdominal margin paler than disk.

Under side: primaries tawny, next the base showing faintly the black markings of the upper side; a small patch of black on inner margin; hind margin and apex pale brown, clouded and spotted on the apex with white; a marginal series of arrow-shaped spots of yellowish-white, the third from the inner angle and two next the apex largest; anterior to these, the transverse row of spots on upper side is reproduced faintly; secondaries pale brown, clouded in the disk and on hind margin with black; a marginal series of unequal silver lunules; above these a row of six black spots edged with yellow, the first next the costa nearly obsolete, the second and third round, the fourth and fifth semi-oval, and the sixth long; the fourth faintly pupilled with white; across the middle of the wing an irregular silver band, and between this and the base several silver spots, all edged with dark brown; within the cell two small yellow spots; body above greenish-black, beneath white; antennæ brown, annulated with white; club reddish-brown.

Female. One-third larger than male, which it closely resembles; the marginal spots on primaries beneath are long and attenuated; the silver lunules of secondaries take the form of a deeply crenated band; a distinct silver pupil in the fourth black spot. Expands 1.4 inch.

Illinois, Missouri.

EDWARDS.

LIMENITIS Fab. *Nymphalis* Latr. p. 64.

5. **L. weidemeyerii** *Edwards.* Pr. Acad. Nat. Sci. Philad. 1861.

Male. Upper side brownish-black, with a broad common white band a little beyond the middle, making an obtuse angle within on the primaries and tapering towards the abdominal margin of secondaries, divided into long spots by the nervures; posterior to this band on secondaries an obsolete row of fulvous spots; within the hind margin of both wings a series of small white spots, minute on secondaries; between these and the band on costal margin of primaries a short transverse row of four white spots, the second largest, the fourth minute; crenations white.

Under side paler, with a common white band and four white spots on primaries as above; on secondaries a row of fulvous spots posterior to the band; a little within the hind margin of both wings a series of large lunules cut transversely and unequally by a crenated black line parallel to the margin; these lunules are bluish-white except towards apex of primaries, where the inner row is white; on primaries a narrow ferruginous band upon the discal arc, followed within the cell successively by blue atoms, a bluish-white band and a ferruginous band, both narrow, transverse, and oblique; next the base blue atoms; costa ferruginous; on secondaries the broad abdominal margin is bluish-white; the entire space between the band and the base is striped transversely with white and bluish-white, divided into spots by the nervures, with ferruginous lines between the stripes; costa white; body above black; beneath white, with a black stripe along the side of abdomen; palpi and legs white; antennæ and club brownish-black. Expands 2.6 inch.

Rocky Mountains.

Edwards.

Fam. SATYRIDAE, p. 70.

SATYRUS Fab. p. 76.

5. **S. sylvestris** *Edwards.* Pr. Acad. Nat. Sci. Philad. 1861.

Male. Upper side brown; fringe same color; behind and along the discal cell of primaries a dark patch extending from the base half way to the apex; near the apex a small round black spot with a faint iris; a black point near the inner angle. Under side

paler; primaries with a tinge of yellow; two ocelli corresponding to the spots above, the larger next the apex, each with white pupils and yellow iris; the disks of both wings finely streaked with dark brown; a dark line parallel to and near the hind margin of primaries; on secondaries are two dots—a white one in the anal angle, a dark one near the apex.

Female. Same size as the male, a little lighter color; near the apex of primaries a single spot; the dark patch as in the male; on the under side two dots near the anal angle of secondaries. Expands 1.9 inch.

California.

EDWARDS.

COENONYMPHA, p. 80.

3. **C. inornata** *Edwards.* Pr. Acad. Nat. Sci. Philad. 1861.

Male. Upper side ochrey brown, lighter in the disk of all the wings; costal margin of primaries and abdominal margin of secondaries grayish; no spots above or below; fringe gray, crossed by a darker line.

Under side: primaries same color as above from the base to beyond the middle; then a transverse sinuous ray of paler color, and beyond this to hind margin grayish; sometimes this ray disappears, the basal color extending nearly to the apex; secondaries gray, with a slight greenish tinge, darker from base to middle, and this shade separated from the paler margin by a transverse, tortuous, interrupted ray, the course of which is parallel to the hind margin.

Female. Wholly dull ochrey yellow, marked as the male. Expands 1.4 inch.

Lake Winnipeg.

EDWARDS.

4. **C. ochracea** *Edwards.* Pr. Acad. Nat. Sci. Philad. 1861.

Male. Upper side entirely of a bright, glossy ochre yellow, without any spot or mark, except what is caused by the transparency of the wings; base of both wings dark gray; abdominal margin of secondaries pale gray; fringe pale gray, crossed by a darker line.

Under side: primaries same color as above; costal margin, apex and base grayish; near the apex a round, sometimes rounded-

oblong, black spot with white pupil and pale yellow iris; this is preceded by an abbreviated, pale yellow, transverse ray.

Secondaries light reddish-brown, grayish along the hind margin; abdominal margin and base dark gray; near the hind margin and parallel to it is a series of six black dots, sometimes obsolete, usually with white pupil and broad yellow iris; near the base two irregular pale brown spots, and midway between the base and the hind margin a sinuous, interrupted ray of same color, extending nearly across the wing.

Female. Like the male. Expands 1.4 to 1.6 inch.

Lake Winnipeg; Kansas; California.

EDWARDS.

FAM. VIII. LYCÆNIDAE, p. 81.

LYCÆNA OCHS. (*Thecla* Fab.) p. 11.

26. L. anna *Edwards.* Pr. Acad. Nat. Sci. Philad. 1861.

Male. Upper side violet-blue with a pink tinge, brighter at the base and on costal margin of primaries; hind margin of both wings narrowly edged with black, which in the primaries extends slightly along the nervures and the costal margin; fringe white.

Under side grayish-white with a tinge of blue at the base; primaries with a discal streak, followed by a transverse series of six small black spots, the one next the inner angle double, and the fifth largest; both wings bordered by rusty spots surmounted by black crescents, the four or five nearest the anal angle powdered posteriorly with silver atoms; secondaries have three small spots near the base, an obsolete discal spot, and a transverse series of eight small spots in a double unequal curve.

Female. Upper side light brown, with an obsolete discal spot on primaries; hind margin of both wings bordered by a series of fulvous crescents, which in the secondaries partly inclose spots of dark brown. Under side fawn-colored, marked as in the male. Expands 1.3 inch.

California.

EDWARDS.

27. L. acuddérii *Edwards.* Pr. Acad. Nat. Sci. Philad. 1861.

Male. In size, form and color, resembles *ægon* of Europe. Upper side dark violet blue; hind margin of both wings and cos-

tal margin of secondaries edged with black; costal margin of primaries has a fine black border; fringe white.

Under side dark gray; primaries have an oval black discal spot, a transverse, tortuous series of six black spots, all edged with white, the one next the inner angle double, the fifth twice as long as the others; on the hind margin a double series of faint spots; secondaries with four black spots near the base, one being very close to the inner margin, and minute; a discal streak and a series of eight spots in a double unequal curve, all of which, as well as the basal spots, are edged with white; a marginal series of six or seven metallic spots, each surmounted by a spot of fulvous, which is bordered anteriorly by a dark crescent; these metallic spots are edged posteriorly and sometimes replaced by black; ends of nervures expanded into small black spots.

Female. Upper side brown, with a black discal spot on primaries; secondaries with a marginal row of obsolete spots surmounted by grayish crescents. Under side pale buff; primaries as in the male, except that the discal spot is preceded by a small double spot, and all the spots are larger; on the secondaries the spots are less distinct, and some of them wanting; the transverse series is set in a band of white; marginal spots without the metallic gloss. Expands 1.1 inch.

Lake Winnipeg.

EDWARDS.

28. **L. fuliginosa** *Edwards.* Pr. Acad. Nat. Sci. Philad. 1861.

Male. Upper side entirely blackish-brown; fringe lighter. Under side light brown, with a dark discal spot and a double row of rusty points parallel to the hind margin of both wings, the outer row on primaries obsolete.

Female. A little larger, of lighter color both above and below, but similarly marked. Expands 1.3 inch.

California.

EDWARDS.

FAM. VI. ÆGERIADAE, HARRIS, p. 137.

TROCHILIUM, p. 137.

13. **T. acerni** *Clemens.* Proc. A. N. S. for 1860, p. 14.

Both wings transparent. Antennæ little thickened at the tips.

Abdomen sessile, tufted at the tip. Hind tarsi very slender and smooth, as long as the tibiæ.

Head and labial palpi deep reddish-orange, the former white in front of the eyes. Antennæ bluish-black, the basal joint reddish-orange in front. Thorax ochreous yellow, with the tegulæ in front touched with pale bluish-black. Abdomen bluish-black, varied with ochreous yellow; terminal tuft deep reddish-orange. Fore wings with the margins and median nervure bluish-black, dusted with yellowish; a large discal, bluish-black patch; terminal portion of the wing ochreous yellow, with a blackish subterminal band, and the nervules blackish; the hinder margin bluish-black and the cilia deep fuscous. Hind wings with a black discal patch; nervules blackish, and hinder margin blackish. Under surface of the body ochreous yellow, with a bluish-black patch on each side of the second abdominal segment. The middle and posterior tibiæ annulated with bluish-black at their ends; the anterior blackish, with the coxæ touched with reddish-orange. All the tarsi touched with blackish above. The larva bores the trunk of the maple.

Northern States.

CLEMENS.

Group **Paranthrene.**

14. T. bassiformis *Walker.* C. B. M. VIII. 39.

Male. Black. Head with red hairs behind. Palpi red, with some black hairs beneath. Antennæ red, minutely pectinated, very slightly thickened towards the tips, very much longer than the thorax. Thorax with two testaceous (?) stripes. Abdomen with testaceous (?) dorsal spots, much narrower than that of P. *vespiformis.* Posterior tibiæ with a single testaceous band; fore tibiæ and anterior tarsi red; hind tibiæ and hind tarsi much longer than those of *Æ. vespiformis*; hind tarsi testaceous. Fore wings purplish, with a limpid basil stripe, and with a reddish streak in front. Hind wings limpid, with a lurid tinge; ciliæ cupreous. Length of the body 6½ lines; of the wings 12 lines.

United States.

WALKER.

15. T. pyramidalis *Walker.* C. B. M. VIII. 40.

Male. Black. Head with yellow hairs about the eyes. Palpi yellow beneath; third joint elongate-conical, much less than half

the length of the second. Antennæ rather stout, almost filiform, slightly pectinated, ferruginous beneath, very much longer than the thorax. Thorax with two yellow spots on each side, one at the base of the fore-wing and one in front. Abdominal segments with yellow bands, which are broadest and most distinct beneath. Legs with whitish stripes. Wings limpid with blackish cupreous ciliæ. Fore wings blackish cupreous along the costa and at the tips, and with a blackish cupreous band, which is slightly bordered with red; a red line along the hind border. Length of the body 5½—6 lines; of the wings 9—11 lines.

St. Martin's Falls, Albany River, Hudson's Bay.

WALKER.

Group **Bembecia.**

16. **T. odyneripennis** *Walker.* C. B. M. VIII. 42.

Female. Dark brown, slightly cupreous. Head whitish about the eyes. Palpi yellow, obliquely ascending, not long. Antennæ bluish-black, simple, subfiliform, rather stout, very little longer than the thorax. Thorax with three yellow spots on each side. Abdomen with a yellow band on the hind border of each segment. Legs yellow; femora striped with brown. Wings limpid, with cupreous ciliæ. Fore wings cupreous along the costa and at the tips, and with the usual band of the same hue. Length of the body 5½—6½ lines; of the wings 11—13 lines.

Nova Scotia.

WALKER.

17. **T. emphytiformis** *Walker.* C. B. M. VIII. 43.

Male. Purplish black. Head with white hairs in front. Palpi thickly clothed beneath with rather long brown and tawny hairs. Antennæ ferruginous. Thorax with a yellow band in front, and with a yellow spot at the base of each fore wing, and one at the tip of the scutellum. Abdomen with a yellow band on each segment; apical tuft black, with a few yellow hairs. Legs red, partly yellow; femora black; tibiæ with black stripes. Wings purplish cupreous. Fore wings yellow and partly red in the disk, which is interrupted by the usual band. Hind wings slightly streaked with red, limpid towards the base. Length of the body 5 lines; of the wings 10 lines. *Female.* Head yellow in front and along the hind border. Palpi yellow, clothed beneath with reddish hairs. An-

tennæ red, blackish towards the tips. Apical tuft of the abdomen luteous, with a few black hairs on each side. Tibiæ wholly red. Fore wings with red disks. Hind wings mostly red along the borders.

In this species and in the *Æ. Odyneripennis* the antennæ of the male are more deeply pectinated than in the European species of the group *Bembecia*.

United States.

WALKER.

18. **T. pyralidiformis** *Walker*. C. B. M. VIII. 44.

Female. Cupreous brown. Head with yellow hairs about the eyes. Palpi yellow, slender. Antennæ slender, subclavate, very much longer than the thorax. Pectus with a yellow stripe on each side. Abdomen with a yellow band at the middle of its length. Hind tibiæ mostly yellow; hind tarsi whitish. Fore wings cupreous-brown, with a yellowish basal streak on the under side. Hind wings limpid, with cupreous-brown ciliæ. Length of the body 4 lines; of the wings 8 lines.

United States.

WALKER.

Group **Conopia.**

19. **T. sapygæformis** *Walker*. C. B. M. VIII. 45.

Male. Bluish-black. Head with red hairs behind. Palpi red, black above towards the base. Antennæ serrated and pubescent beneath, very much shorter than those of the European *Conopiæ*. Abdomen with a slight red band at the base; segments from the fifth to the eighth red; apical tuft blue. Anterior tibiæ tawny; hind tibiæ with red tips; tarsi mostly testaceous. Wings with cupreous ciliæ. Fore wings blue, purple towards the tips, with a red discal streak, behind which there is a limpid streak. Hind wings limpid. Length of the body 4 lines; of the wings 8 lines.

This species differs much from the typical form of *Conopia*, and somewhat approaches *Pyropteron*.

United States.

WALKER.

20. **T. geliformis** *Walker*. C. B. M. VIII. 46.

Male. Black. Head white on each side in front. Palpi almost bare; third joint lanceolate, rather less than half the length of the

second. Antennæ bluish-black, simple, ferruginous beneath and slightly thicker towards the tips, about twice the length of the thorax. Abdomen red, black at the base; apical tuft bluish-black; red towards the base. Fore wings bluish-black. Hind wings limpid, with blackish tips and hind borders. Length of the body 3 lines; of the wings 6 lines.

United States.

WALKER.

SANNINA WALKER.

Male. Body rather stout. Proboscis almost obsolete. Palpi slender, curved, acuminated, obliquely ascending, almost bare; third joint very slender, just half the length of the second. Antennæ filiform, simple, rather slender, acuminated at the tips, nearly twice the length of the thorax. Abdomen about twice the length of the thorax. Legs slender; hind tibiæ long and stout, somewhat pilose, as is also the hind metatarsus. Wings narrow, opaque, squamous. Hind wings limpid at the base. *Female?* Palpi a little stouter than those of the male; third joint shorter and stouter. Antennæ like those of the male. Abdomen about twice the length of the thorax. Hind tibiæ more slender and much shorter than those of the male; hind metatarsus slender, not pilose. Fore wings opaque. Hind wings limpid, opaque at the base.

1. S. uroceriformis *Walker.* C. B. M. VIII. 64.

Male. Bluish-black. Head reddish behind. Palpi reddish, black towards the tips above. Thorax somewhat ferruginous. Abdomen with a broad orange band on the fourth segment. Wings metallic green, mingled with blue and purple; ciliæ cupreous. Hind wings limpid at the base. Length of the body 7 lines; of the wings 14 lines. *Female?* Head and palpi black. Antennæ whitish at the base. Abdomen with a red band. Wings with black ciliæ. Hind wings limpid, bluish-black at the base. Length of the body 9 lines; of the wings 14 lines.

United States.

WALKER.

MELITTIA Walker.

Body rather stout. Proboscis elongated. Palpi moderately long, slightly pilose; third joint lanceolate, hardly half the length of the second. Antennæ subclavate or clavate, rather longer than the thorax. Abdomen oblanceolate, much longer than the thorax. Legs stout; hind legs most densely pilose, with long hairs, which extend nearly to the tips of the tarsi. Wings hyaline, rather narrow. Fore wings occasionally opaque; fourth inferior vein not very remote from the third, which is near to the first and to the second.

North America.

1. **M. ceto** *Walker*. C. B. M. VIII. 66.

Aurato-viridis; caput antice et apud oculos album; palpi lutei, basi albi; abdomen rufum maculis dorsalibus nigris, subtus luteum; pedes rufi, nigro albo que varii; alæ anticæ aurato-virides; posticæ limpidæ.

United States.

Walker.

Var.? Olivacea; palpi pallide flavi, fasiculo subapicali nigro; antennæ viridi-nigræ; abdomen ochraceum, fascia basali maculis que dorsalibus nigris; pedes postici pilis extus ochraceis intus nigris dense herti; alæ anticæ olivaceo-fuscæ opacæ, posticæ limpidæ fusco marginatæ.

Massachusetts.

Walker.

2. **M? flavitibia** *Walker*. C. B. M. VIII. *Trochilium tibiale* Harris. Am. Journ. Sci. XXXVI.

Fusesceus; caput apud oculos flavum; antennæ nigræ; thorax flavo bivittatus; abdominis segmenta flavo marginata; tibiæ flavæ, posticæ pilis flavis dense vestitæ; alæ limpidæ, anticæ marginibus fascia que abbreviata pallide fuscis.

New Hampshire.

Walker.

Fam. XI. NOTODONTIDAE, p. 238.

HETEROCAMPA.

3. **H. semiplaga** *Walker*. Canadian Naturalist, 1861.

Male and Female. Cinereous, thickly pilose, with a slight olive-green tinge, whitish-cinereous beneath. Palpi distinct, obliquely ascending, not extending beyond the frontal tuft. Thorax by the hind border and abdomen at the base black. Wings partly clouded with black, adorned with three indistinct irregular denticulated black lines; marginal line black; fringe with black points. Fore wings somewhat rounded at the tips, with a submarginal line of black dots. *Male*. Antennæ tawny, moderately pectinated to three-fourths of the length. *Female*. Antennæ simple. Length of the body 9 lines; of the wings 20 lines.

Township of Montcalm, Canada.

Walker.

Fam. XII. ARCTIADAE, p. 248.

ARCTIA Schr.

Stature robust. Head and thorax with long hairs. Tongue usually very short. Palpi porrect, short, very hairy; first article longer than the second; the third subacute. Antennæ slender, rather long. Thorax not crested. Abdomen annulate, robust. *Male*. Antennæ pectinate. *Female*. Antennæ serrate, sometimes pectinate. Hind tibiæ with four spurs; fore tibiæ simple. Colors and markings different; primaries dark, sometimes white, gray, or yellow, or with bright spots or streaks; secondaries with dark spots on a lighter ground. Secondaries with eight veins. Flight nocturnal. *Larvæ* solitary.

1. **A. americana** *Harris*. Figured in Agassiz' Lake Superior, pl. 7, fig. 5.

Head brown; antennæ white above, with brown pectinations. Thorax brown above, margined before with an arcuated yellowish-white band, which is continued on the outer edge of the shoulder covers; upper edge of the collar crimson-red. Primaries coffee-brown, with three yellowish-white spots on the outer edge, and

crossed by irregular anastomosing yellowish-white lines. Secondaries bright ochre-yellow, with a large reniform central black spot, two round black spots behind, a third smaller spot near the anal angle, and a black dot between the middle and inner margin. Abdomen tawny, with four blackish dorsal spots. Legs dusky; thighs and anterior tibiæ fringed with red hairs; hindmost tarsi whitish, annulated with black.

Lake Superior.

HARRIS.

2. **A. parthenos** *Harris.* Figured in Agassiz' Lake Superior, pl. 7.

Head brown, with a crimson fringe above and between the black antennæ. Thorax brown above, margined before with an arcuated cream-colored band, which is continued on each side of the outer edge of the shoulder covers; upper edge of the collar crimson red. Primaries dusky brown, with three small cream-colored spots on the outer edge; four spots of the same color in a line near the inner margin, and several more scattered on the disk. Secondaries deep ochre-yellow, with the base, the basal edge of the inner margin, a triangular spot in the middle, adjoining the basal spot and a broad indented band behind, black. Abdomen dusky above, tawny at the tip and beneath. Legs dusky, thighs and tibiæ fringed with crimson hairs.

Lake Superior.

HARRIS.

3. **A. placentia** *Abbot.* Figured in Sm. Abb. pl. 65.

Fuscous; primaries with one or three pale testaceous spots; secondaries reddish, margin and some submarginal spots fuscous; abdomen above reddish, with the dorsal spots and apex fuscous.

Var. a. Fore wings with the outer fringe partly pale testaceous; and with several spots and dots of the same color in the disk.

Var. b. Fore wings with the outer fringe wholly blackish-brown, unspotted, except two very minute testaceous dots.

North America.

4. **A. virginalis** *Boisd.* Ann. Soc. Ent. 2me sér. X, 321.

Upper side black, with about twenty yellow spots on the primaries. Secondaries fulvous, with three bands and the principal nerves black; the band of the extremity incomplete, ending before reaching the anal angle; sometimes all the bands are united by

the nerves, the ground is then black, with fulvous squares. Head fulvous; thorax black, with the shoulders yellow; scutellum fulvous; body fulvous above, with black rings, bluish-black below. Under side of the secondaries as above. Under side of the primaries with the spots at the base and of the middle fulvous.

San Francisco.

Boisd.

5. **A. virgo** *Sm. Abb.* Var. *Callimorpha parthenice* Kirby. Figured in Sm. Abb. pl. 62; Naturalist's Lib. vol. 36, pl. 19. Var. in Faun. Bor. Amer. IV, pl. 5.

Primaries carneous, fading to reddish buff, and covered with many stripes and lance-shaped spots of black; secondaries vermilion-red, with several large angular spots towards the posterior margin. Antennæ ferruginous; thorax fulvous, with three broad black stripes and two small black spots over the eyes. Under side of the abdomen black; upper side vermilion red, with a row of black spots close together along the top of the back. *Larva* brown, rather thickly covered with tufts of brown hair.

Var.? Thorax carneous with five black spots; primaries black, with pale carneous streaks; secondaries reddish, with five black spots.

United States.

Nat. Library.

6. **A. virguncula** *Kirby.* Figured in Faun. Bor. Amer. IV, pl. 4.

Head pallid; orbit of the eyes and mouth black; antennæ black, serrato-pennate; thorax pallid with five lanceolate black spots; the posterior ones being the largest; primaries black with pallid rivulets, which are formed by the scales that clothe the nervures, and produce the rays at the apex of these wings, when the lines are traversed by a transverse, angulated band; underneath they are pale, with the black points less distinct, except at the apex; a black spot in the disk near the costal margin; the secondaries are orange-tawny, spotted at the apex with black; abdomen tawny above, below pale, with a dorsal and on each side a double lateral black macular stripe; trunk underneath black, with pale hairs, intermixed; legs black; tibiæ pale above; thighs with a pale spot at the base and apex.

Canada.

Kirby.

7. **A. nais** *Drury*. Figured in Drury, pl. 7.

Antennæ black and pectinated. Head and body light yellowish-brown. Thorax with three black longitudinal marks, and several spots on the abdomen. Primaries black, with broad ochre stripes, the second furcate; ciliæ light yellowish-brown; secondaries light yellowish or ochre brown, with a faint black spot on each and a broad irregular border of a dusky-black running along the external edges, but narrow in the middle. Wings entire. Under side paler.

Var. a. Male. Fore stripe of the primaries not joining the costa.

Var. b. Male. Inner border of the secondaries reddish.

Var. c. Male. Primaries with no pale oblique band towards the tips.

Var. d. Female. Like *Var. c.* Secondaries red, with broad blackish borders. Abdomen wholly brown, except on each side above towards the base.

Var. e. Female. Primaries with testaceous veins; fore stripe and part of the middle stripe almost obsolete.

United States.

WESTWOOD.

8. **A. phyllira** *Drury*. Figured in Drury I, pl. 7; Sm. Abb. II, pl. 64.

Primaries black, ciliæ cream-color; margin next the body cream-color; one longitudinal line, two transverse lines and near the tip two zigzag lines, forming a W of buff. Secondaries red, with four black spots. Margins black.

United States.

HARRIS.

9. **A. parthenice** *Kirby*. Var. *A. virgo*.

Antennæ black pectinated; thorax flesh-colored, with two anterior and three posterior oblong black spots, the latter being the largest; primaries black, with the so-called rivulets pale, with a slight pinkish tint; the main streams, especially towards the apex, form several islets, most of which are divided by slender ones which do not appear on the under side; the secondaries are of the color of red lead, with five black spots towards the posterior margin, the intermediate three forming a macular band above which is one smaller, and below it another. Underneath, also, a small spot at the costal margin above the other.

Canada.

KIRBY.

10. A. dione *Hübn.* Fab., Sm. Abb. *Arge* Drury. Figured in Drury, I, pl. 18; Sm. Abb. pl. 63; Naturalist's Library, vol. 36, pl. 19.

Ground color of primaries and thorax cream-color, sometimes delicate pink; surface variegated with numerous black lines and angular spots. Secondaries cream-color or tinged with red, with a fulvous marginal line and many oblong black spots behind. Antennæ black at the extremities; neck red, with two small black streaks above it; thorax with a black stripe in the centre and another on each side; abdomen with three rows of black spots, those along the back being largest. Anterior femurs red, with two black spots close to the head.

Var. a. Primaries reddish-white, with cuneiform black spots. Secondaries red, with black yellow bordered spots.

Var. b. Spots of the primaries much larger and forming a stripe toward the hind border.

Var. c. Spots of the primaries still larger and more inclined to form stripes. Spots of the secondaries without yellow borders.

Var. d. Secondaries whitish, spots small and without yellow borders.

Larva dark brown, with five pale or yellow longitudinal stripes, each segment bearing a transverse row of fulvous tubercles, from which spring a dense tuft of brown hairs.

United States.

NAT. LIBRARY.

11. A. hyperborea *Curtis.* C. B. M. 611.

Fuscous; primaries with a costal spot and posterior vitta interrupted with rust-red; secondaries fuscous, with a band unimaculate and margin ochry.

Arctic America.

WALKER.

12. A. isabella *Hübn.* Figured in Sm. Abb. II, pl. 68.

Antennæ filiform, tawny-yellow. Thorax tawny and brownish. Abdomen tawny, deeper color beneath; three rows of black spots, six or seven in each row. Primaries tawny, with a few black scattering spots. Secondaries nearly transparent, slightly tawny, with six spots; legs black or dark brown.

United States.

SM. ABBOT.

13. A. gelida *Möesch.* C. B. M. 611.

Black, thorax bivittate with yellow; sides of the abdomen yellow, spotted with black; primaries yellowish, with black angular spots; secondaries subcinereous.

Labrador.

WALKER.

14. A. rubricosa *Harris.* Ins. Mass. 253.

Primaries reddish-brown, almost transparent, with a small black spot near the middle; secondaries dusky, becoming blacker behind (more rarely red with a broad blackish border behind), with two black dots near the middle; the inner margin next to the body and the fringe, reddish; thorax reddish-brown; abdomen cinnabar red, with a row of black dots on the top and another row on each side. Expands an inch and a quarter.

Massachusetts.

HARRIS.

15. A. dahurica *Boisd.* Ann. Soc. Ent. 2me sér. X, 321. Figured in Boisd. Icon. Hist. Lep. 126, 2, pl. 60.

Carneous; head, three streaks of the body and numerous intercostal spots of the primaries black; secondaries yellowish, base and ciliæ yellow, with black spots.

California, Siberia.

BOISD.

16. A. figurata *Drury*, II, pl. 12.

Upper side. Antennæ dark brown and pectinated. Thorax cream-color and black. Abdomen black, sides red. Primaries black, a cream-colored line running from the shoulders parallel to and at a small distance from the posterior edge, towards the lower corner, stopping at about one-third from the external edge, from whence, near the end of this line, arise two others, which run almost to the anterior edges. Secondaries, red in the middle, surrounded, except on the abdominal edges, by a broad black margin. Sometimes only with a small red spot on the secondaries.

Under side. Palpi hairy and black; wings as on the other side, with the colors less distinct.

Southern States.

WESTWOOD.

SPILOSOMA Steph.

White, gray or yellow, with black dots or vittæ; abdomen with five rows of black dots, one above and two rows on each side; sometimes the points indistinct.

1. **S. acrea** *Drury.* *Caprotina* Cram.; *pseuderminea* Peck. Figured in Drury, I, pl. 3; Cram. Pap. Exot. III, pl. 287; Sm. Abb. pl. 67.

Head, thorax and primaries of the male cream-color or deep ochre-yellow; the surface of the latter with numerous black spots, five of which are placed in a regular row along the anterior border and six on the external one; secondaries entirely yellow, with a few black spots near the external edge and middle. Abdomen yellow, with a row of black spots down the centre and another on each side; apex cream-colored; under side of wings and thighs deep yellow. *Female.* All the wings white, with numerous black spots, variable in their distribution, but there is a marginal row on the inferiors which is wanting in the male. Eyes and antennæ in both sexes, black.

Larva white, when young; nearly black, when full grown; intermediate stage, reddish-brown; two yellow lines along the sides, and a transverse series of orange spots on each segment. From the back of each segment arises a tuft of blackish hairs.

2. **S. echo** *Sm. Abb.* Figured in Sm. Abb. II, pl. 68.

Wings white, veins on both sides margined with black; abdomen luteous, with black spots.

Georgia.

Sm. Abbot.

3. **S. virginica** *Fab.* Supp. Ent. s. 437. C. B. M. 668. *Epimenis* Drury, III, pl. 29.

White, with a black point on the middle of the primaries, and two black dots on the inferiors; one in the middle and the other near the posterior angle, much more distinct on the under side; a row of black dots on the back; another on each side and between these a longitudinal deep yellow stripe; femora and tibiæ of the fore legs ochre-yellow.

Larva varies in color; often of a pale yellow or straw color,

with a black line along each side of the body, and a transverse line of the same color between each of the segments, and it is covered with long pale yellow hairs. Others are of a brownish-yellow or foxy red. Head and ends of the feet ochre-yellow; body below blackish.

Var. a. Wings wholly white.

Var. b. Primaries with one black dot.

Var. c. Primaries with one black dot; secondaries with two black dots.

Var. d. Primaries with two black dots; secondaries the same.

Var. e. Primaries with three black dots; secondaries the same.

North America.

WALKER.

4. **S. cunea** *Drury.* *Punctatissima* Sm. Abb. Figured in Drury, I, pl. 18; Sm. Abb. pl. 70.

Antennæ black, pectinate; head white; back and abdomen ash-color. Primaries white; spots numerous, of many forms, and sooty black; external margin with five spots; those nearest the tips triangular. Secondaries with a dark spot near the external edge, and faintly marked near the external angle. Length of the body 5—6 lines; of the wings 13—18 lines.

WALKER.

5. **S. congrua** *Walk.* C. B. M. 669.

White. Tarsi with black bands. Fore coxæ and fore femora luteous, with black spots on the inner side; fore tibiæ striped with black on the inner side. *Male.* Head and fore part of the thorax with a slight testaceous tinge. Primaries with four oblique very imperfect and irregular bands, composed of pale brown dots. Length of the body 6—7 lines; of the wings 16—20 lines.

Georgia.

WALKER.

6. **S. egle** *Drury.* Figured in Drury, II, pl. 20.

Wings rather long, thin, delicate, of a bluish-gray color, paler on the front edge and without spots; head, thorax, under side of the body and legs, gray; neck cream-color; top of abdomen bright yellow, with a row of black spots and two rows on each side. Expands from one inch and three-quarters to nearly two inches.

Larva black; a whitish line on each side, covered with short tufts of hairs proceeding from tubercles.

United States.

WALKER.

7. **S. textor** *Harris.* Ins. Mass. p. 275, 2d ed.

White, without spots; fore femurs tawny-yellow; feet blackish. Expands from one inch and a quarter to one and three-eighths.

Larva greenish, dotted with black; a broad blackish stripe along the top of the back, and a bright yellow stripe on each side. The warts from which the thin bundles of spreading, silky hairs proceed, are black on the back and rust-yellow or orange on the sides. Head and feet black. Spin large webs and live in communities.

Northern States.

HARRIS.

8. **S. collaris** *Fitch*, 3d Report, 265.

Milk-white and glossy; head, neck, base of the outer edge of the fore wings and anterior hips pale ochre-yellow; feet pale brown. Width 1.35.

Mississippi.

FITCH.

9. **S. punctata** *Fitch*, 3d Report, 265.

White; a continuous black stripe on the fore side of the anterior feet and shanks, their thighs and hips being yellow in front and the fore wings having a black central dot, and in the males a row of small blackish spots extending from the middle of the inner margin to the tip.

New York.

FITCH.

CALLIMORPHA LATR. *Hypercompa* Hübn.

Palpi very short, pilose, scales appressed; tongue much longer than the head; antennæ in both sexes simple, ciliated, with two strong *setæ* at each joint. Body slender. Wings densely squamose. Feet robust, squamose; anterior tibiæ much shorter than the femora.

1. **C. clymene** *Esper.* *Colona* Hübn. *Carolina?* Harris. Figured in Esper Schmett. IV, 22, 10, pl. 182; Noct. 103, f. 1.

Luteous; antennæ black; palpi black at the apex; prothorax biguttate with fuscous; disk of thorax white, univittate with fuscous; abdomen often with fuscous dorsal spots; primaries with an angulate basal fuscous vitta, three anterior spots and one posterior subapical divided, white; secondaries often with two fuscous spots.

Var. a. Secondaries with three submarginal spots and a marginal streak.

Var. b. Secondaries with two submarginal spots.

Var. c. Secondaries with one submarginal spot.

Var. d. Secondaries immaculate.

United States.

WALKER.

2. **C. militaris** *Harris.* Ins. Mass. 2d ed. p. 264.

Primaries white, almost entirely bordered with brown; with an oblique brown band from the inner margin to the tip; the brown border on the front margin generally has two short angular projections, extending backwards on the surface of the wing. Secondaries white, without spots. Body white; head, thorax and femurs yellow; a longitudinal brown stripe along the top of the back from the thorax to the tail.

Var. a. Primaries with four white spots; second nearly round.

Var. b. Second spot forked; fourth interrupted.

Var. c. Third spot nearly divided.

Var. d. Second and third spots divided.

United States.

HARRIS.

4. **C. confinis** *Walker.* C. B. M. 661.

White. Head, prothorax, fore coxæ and abdomen at the base luteous. Proboscis tawny. Palpi with black tips. Antennæ black. Thorax and abdomen with a brown stripe. Primaries brown, with a discal slightly angular white stripe, and an elongate triangular oblique subapical white band. Length of the body six lines; of the wings eighteen lines.

United States.

WALKER.

5. **C. contigua** *Walker*. C. B. M. 650.

White. Head, prothorax and fore coxæ luteous. Proboscis tawny. Palpi black, luteous at the base. Antennæ black. Thorax and abdomen with a brown stripe. Primaries brown, with a white discal stripe which widens from the base to a little beyond the middle, and with two large subapical white spots. Secondaries with a small brown spot near the hind border. Body 6 lines long; wings 18.

United States.

WALKER.

6. **C. comma** *Walker*. C. B. M. 652.

Luteous, partly testaceous. Proboscis tawny. Palpi with black tips. Antennæ black. Thorax and abdomen with a brown stripe. Primaries above with a brown border, which is interrupted at the tips and by the hind angle, near which there is a curved brown streak. Secondaries occasionally with a small round brown spot near the hind border. Body 7 lines long; wings 20.

United States.

WALKER.

PHRAGMATOBIA STEPH.

Head and thorax with long hairs. Palpi short, scarcely distinct, very pilose. Proboscis subspiral. Antennæ short, ciliate—*of the male*, serrate; *of the female*, simple. Thorax thick. Abdomen maculate. Anterior tibiæ unarmed; posterior tibiæ with four spurs. Wings subdiaphanous.

1. **P. vagans** *Boisd.* Ann. Soc. Ent. 2me sér. X, 322.

Mouse-color; primaries immaculate; secondaries black, fringe cinereous; all the wings cinereous below, with a black lunule.

North California.

BOISD.

2. **P. assimilans** *Walker*. C. B. M. 630.

Male. Red. Antennæ testaceous. Thorax with brown hairs. Wings red; veins darker. Primaries slightly brown along the costa, and elsewhere indistinctly sprinkled with pale brown, with two blackish dots. Secondaries brighter red, with three black dots, two in the disk and one near the hind border towards the inner angle. Length of the body 6 lines; of the wings 16 lines.

Var. Primaries almost wholly brown. Secondaries with a broad blackish submarginal stripe.

United States.

WALKER.

ECPANTHERIA WALKER.

Body stout. Proboscis moderately long. Palpi very short; third joint acuminated, small. Abdomen extending more or less beyond the hind wings. Legs stout; hind tibiæ with minute apical spurs. Wings moderately broad. Primaries much longer than secondaries. *Male.* Antennæ serrated; secondaries short. *Female.* Antennæ simple, not serrated.

1. **E. scribonia** *Stoll.* *Macularia* Fab., Cram. *Oculatissima* Sm. Abb. *Chryseis*, Godt. Figured in Stoll. Supp. Cram. V, pl. 41; Sm. Abb. pl. 69; Nat. Lib. vol. 37.

Antennæ black; head white, with a black point on each side near the antennæ. Thorax with ten or twelve black spots, with a pale bluish-white centre, making them appear annular; the two hinder spots largest and somewhat curved. Ground color of the wings white, the surface of the superiors variegated with black spots, most of which are ocular, placed irregularly towards the base, but having a tendency to form transverse rows externally; inferiors white, with a few faint black spots behind. Abdomen blue-black, variegated on the back and sides with orange-yellow; legs white, the extremities with black rings.

Larva brownish-black, with an orange-red band along each side. The hairs are placed on tubercles alternately nearer the anterior edges of each segment, so that they form a pretty broad band and leave the rest of the body naked.

United States.

NAT. LIBRARY.

HALESIDOTA WALKER. *Lophocampa* Har.

Body stout. Proboscis long. Palpi stout, porrect, not long; second joint much longer than the first; third conical, very minute. Abdomen extending for about one-third of its length beyond the secondaries. Legs stout; hind tibiæ with four moderately long

spurs. Wings long, narrow. *Male.* Antennæ slightly pectinated. *Female.* Antennæ serrated.

1. **H. caryae** *Harris.* Ins. Mass. 2d ed. p. 279.

Color, light yellow-ochre; the fore wings are long, rather narrow, and almost pointed, are thickly and finely sprinkled with little brown dots, and have two oblique brownish streaks passing backwards from the front edge, with three rows of white semitransparent spots parallel to the outer hind margin; the hind wings are very thin, semitransparent, and without spots; and the shoulder-covers are edged within with light brown. They expand from one inch and seven-eighths to two inches and a quarter or more. The wings are roofed when at rest; the antennæ are long, with a double, narrow, feathery edging, in the males, and a double row of short, slender teeth on the under side, in the females; the feelers are longer than in the other Arctians, and not at all hairy; and the tongue is short, but spirally curved.

Larva covered with short spreading tufts of white hairs, with a row of eight black tufts on the back, and two long, slender, black pencils on the fourth and on the tenth ring. The tufts along the top of the back converge on each side, so as to form a kind of ridge or crest; and the warts, from which these tufts proceed, are oblong-oval and transverse, while the other warts on the body are round. The hairs on the forepart of the body are much longer than the rest, and hang over the head; the others are short as if sheared off, and spreading. The head, feet, and belly are black; the upper side of the body is white, sprinkled with black dots, and with black transverse lines between the rings.

United States.

HARRIS.

2. **H. tesselaris** *Sm. Abb.* Figured in Sm. Abb. pl. 75.

Faintly tinged with ochre-yellow; their long, narrow, delicate, and semitransparent wings lie almost flatly on the top of the back; the upper pair are checkered with dusky spots, arranged so as to form five irregular transverse bands; the hind edge of the collar, and the inner edges of the shoulder-covers are greenish-blue, and between the latter are two short and narrow deep yellow stripes; the upper side of the abdomen and of the legs are deep ochre-yellow.

The tufts on the *larva* are light yellow or straw-colored, the crest being very little darker; on the second and third rings are two orange-colored pencils, which are stretched over the head when the insect is at rest, and before these are several long tufts of white hairs; on each side of the third ring is a white pencil, and there are two pencils, of the same color, directed backwards, on the eleventh ring. The body is yellowish-white, with dusky warts, and the head is brownish-yellow.

United States.

HARRIS.

3. **H. fulvo-flava** *Walk.* C. B. M. 733.

Testaceous, paler beneath. Proboscis tawny. Thorax with two tawny stripes, which converge hindward, and with two tawny spots in front between the stripes. Femora and tibiæ hairy; fore femora and fore tibiæ tawny above. Primaries yellow, with a tawny spot at the base, with two oblique tawny bands, with darker borders; these bands are partly connected, and the inner one is especially irregular and ramose, being forked in front and dilated in the disk towards the base, and emitting a branch to each border. Secondaries whitish, with a slight testaceous tinge. Length of the body 6—7 lines; of the wings 16—18 lines.

Var. Primaries tawny, with yellow spots at the base, at the tips, along the costa, and forming an oblique band beyond the middle.

North America.

WALKER.

4. **H. annulifascia** *Walker.* C. B. M. 734.

Pale testaceous. Proboscis and antennæ tawny. Thorax with two tawny stripes, which converge hindward. Primaries with tawny punctures, which are most numerous, and partly confluent on the disk beyond the middle, and with four oblique bands of whitish tawny bordered spots; veins tawny. Secondaries whitish, with a slight testaceous tinge. Length of the body 6—8 lines; of the wings 18—22 lines.

United States.

WALKER.

5. **H. maculata** *Harris.* Ins. Mass. 259.

Light ochre-yellow, with large irregular light brown spots on the primaries, arranged almost in transverse bands. It expands nearly one inch and three-quarters.

HARRIS.

DASYCHIRA, p. 256.

3. **D. clandestina** *Walker*. Canadian Naturalist, 1861, p. 36.

Male. Cinereous, varied with black, thickly pilose. Antennæ short, broadly pectinated. Legs short, very pilose. Wings partly shaded with black, with four irregular undulated black lines which are dilated on the costa of the fore wings; under side paler, with the lines obsolete except by the costa. Length of body 6 lines; of wings 14 lines.

Bevins Lake, Montcalm, July 7.

WALKER.

For the following notes of synonymy, geographical distribution, etc., I am indebted to Mr. W. H. Edwards. J. G. M.

OBSERVATIONS BY W. H. EDWARDS.

The following species are known to be resident in Texas, &c., by me:—

Papilio pilummus. Texas.

" *aristodemus.* Texas.

" *cresphontes.* This has been confounded with *Thoas*, but is restored by Doubleday. Ménétriés, in Cat., notes the difference between these two species.

Leptalis melite. New Mexico. Boisd. Spec. Gen. 422.

Callidryas cipris. Texas. Boisd. Spec. Gen.

" *orbis.* Texas. Boisd. Spec. Gen.

" *philea.* Florida and Texas. Boisd. Spec. Gen.

" *argante.* Texas. Boisd. Spec. Gen.

Terias midea. California, according to Ménétriés in Cat. Boisd. Spec. Gen.

" *palmira.* Poey in Memorias. Florida and Georgia.

" *elathea.* Georgia. Boisd. Spec. Gen.

Colias curytheme. Boisd. Ann. Ent. Soc. X, 286. This is the species usually taken for *Edusa*, I believe. Boisduval had doubts of *Edusa* being found in this country. I have never seen the European *Edusa* here, and do not believe in it.

Synchloe janais. Texas. Drury, III, 17.

Catagramma clymene. Florida. Described and figured in Lucas.

Cystineura amyone. Texas. Ménétriés, in Cat. and figured.

Eumenia atala. Florida. Figured and described in Poey's Cent.

Rhodocera clorinde. Texas. Boisd. Spec. Gen.

Marpesia zerynthia. Texas. Hübner.

Ageronia feronia. Texas. } One or both of these is figured in Drury.

" *fornax.* Texas. }

Timetes chiron. Texas. Herbst. 52.
Limenitis eulalia. California. Doubleday & Hewitson.
Smyrna karzinski. Texas.
Victorina steneles. Figured and described in Lucas.
Megistanis cadmus. Texas. Cramer.
Cybdelis hyperipte. Florida. Hübner.

Besides these, I find mentioned in authors—

Parnassius Smintheus. Rocky Mountains. Doubleday & Hewitson.
Colias rutulans. California. Boisd.
Argynnis Boisduvalli. Labrador. Sommer.
" *thais.* Figured in Godart, and described in Herbst.
" *frigga.* Herbst. 273.
Chionobas chryxus. U. S. Doubleday & Hewitson.
" *bore.*
Mycalesis ostita. Georgia. Hübner.
Thecla melinus. California. Boisd. Ann. Soc. Ent. X.
Lycaena Franklinii. Polar Amer. Curtis in Ross Exp.
Polyommatus antheile. Newfoundland. In C. B. M.
" *amicctus.* Albany River.
Thanaos tristis. California and Texas. Boisd. Ann. X.
" *Cervantes.* California. Graslin, Ann. Ent. Soc.
Anthocaris creusa. California.
" *lanceolata.* California.
" *ausonia.* California.
Paphia glycerium. Texas; Illinois.

P. rutulus is said by Gray to be *eurymedon.*

P. zolicaon is said by Ménétriés, in Cat., to be same as *machaon.*

P. ajax I do not believe to be same as *marcellus.* All my *ajax* came from Savannah, ♂ and ♀, and all my *marcellus* from West Virginia, ♂ and ♀. All of each were taken in the Spring.

Nathalis irene Fitch, is simply *iole*, with a trifling variation.

C. Vosnesenski of Ménétriés, is *C. eurydice* of Boisd. in Ann.

Melitaea zerene should have been *Argynnis.*

M. palla is not a synonym for *nycteis* of Doubleday, as given on page 52. The latter is found in Illinois and vicinity.

On page 70, *orion* has a vast distribution. It comes from Brazil, Grenada, Central America, and West Indies. It is as likely to be in Florida as any other species common to Cuba.

Debis andromacha and *portlandia* are the same.

Canonympha semidea, page 80. This species is a *Chionobas.* Is same as *C. also* of Boisd., but Say should have the preference.

Page 101. *T. aubumiana* is *smilacis.*

Page 111. *H. ahaton* is *cernes.*

CORRECTIONS BY DR. B. CLEMENS.

Page 340. *Arctia isabella* is *Spilosoma isabella*.
" " *A. rubricosa* is *A.? rubricosa*, probably identical with the genus *Crocota*.
" 342. *Spilosoma echo* is *Hypantria echo*.
" " *S. cunea* is *Hypantria cunea*.
" 343. *S. textor* is *Hypantria textor* (type gen.).
" " *S. egle* is (*Euchates*) *egle*.
" " *S. collaris* and *S. punctata* probably likewise belong to the genus *Hypantria*.
" 344. Gen. *Callimorpha* should be *Hypercompa;* the latter is a generic group created from the former.
" 345. *C. comma* is *Hypercompa interrupto-marginata* Beauv.
" 349. *H. fulvo-flava* synon. *H. maculata?*
" " *H. annulifascia* synon. *H. caryæ?*

ERRATA.

In the description of *A. aphrodite*, on p. 43, after "marginal," add, "triangles surmounted with black, and above them, near the costa, two others; the secondaries have a marginal series of black crescents."

P. 82, 5th line from bottom, *read* "secondaries," *instead of* "primaries."
P. 96, 21st " " " "often," " "after."
Orgya, p. 249, should be put into Fam. Liparidæ.
Dasychiea, p. 256, " " " "
Lagoa, p. 257, " " " Limacodidæ.
Mioza, p. 253, *read* Mieza.
P. 329, 3d line from bottom, *read* "*L. Scudderii.*"

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[1] Synonyms are in italics; names of families in heavy faced type, of subfamilies in small capitals.

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